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Green Wood in the Blast Furnace

Making Pig Iron of Tofo Ores at Corral, Chile—
Wood Charred in Upper Part of Furnace and Dis-
tillates Recovered—Chilean Government Report

BY FRANÇOIS PRUDHOMME*

THE Corral steel plant has been planned for manufacturing 50,000 tons of steel yearly. It is owned by a French company and will be worked with the help of the Chilean Government according to an agreement of which the provisions are under discussion at this writing. The same French company is owner of the Tofo iron mines, which were leased out to the Bethlehem Steel Corporation, a reservation being made for the supply of the Chilean blast furnaces up to 100,000 tons of iron ore yearly. The Tofo iron ore is a first class one, analyzing iron, 67 per cent; phosphorus, 0.02 per cent; sulphur, 0.02 per cent; silicon, 2 per cent.

The Corral steel plant when finished will consist of the following equipment:

1—Two 100-ton blast furnaces, supplied with crude wood as fuel, with seven Cowper stoves, roasting-furnaces and accessory machinery already installed.

2—Three 40-ton basic open hearth furnaces and accessory machinery, to be installed.

3—28-in. rolling mill, to be installed.

4—18-in. rolling mill; 13-in. cogging mill; 10-in. rolling mill, electrically driven and already installed.

5—Central 4000-hp. steam power house with 2000-hp. in boilers already installed.

6—Central set of gas producers, in connection with the blast furnace gas flues, for supplying gas to furnaces within the plant. The gas producers will be supplied with good grade brown coal, with which the southern part of Chile abounds. The gas producers are to be installed.

7—Lidgerwood equipment for the working of the forests and to be installed.

8—A refining plant for the pyroligneous acid produced by the wood distillation within the blast furnaces; to be installed.

One of the two blast furnaces was in blast in the years 1910 and 1911. But as a consequence of disagreements between the French company and the Chilean Government, it had to be banked until June, 1920. At this time new experiments had been performed, as required by Chile, before operations could be resumed by the French company.

The chief peculiarity of the Corral plant is its using of the Prudhomme blast furnace system, involving the burning of substantially green wood instead of charcoal in the making of pig-iron.

The wood is only dried and heated by passing through a tunnel, in which are received at 150 deg. C. (300 deg. Fahr.) the burned gases of every furnace of the plant. The gases are handled by a fan capable of 80 cu. m. (2800 cu. ft.) every second.

After emerging from this tunnel, the wood is charged, hot and dry (10 to 15 per cent moisture) into the blast furnace. In the upper part it is charred, arriving in the condition of finished charcoal at about ten meters (33 ft.) above the plane of the tuyeres. The charring is made easier by a set of small tuyeres bringing at some meters (yards) beneath the top enough hot blast to keep the top always dry. The method has been patented by the author in the United States as well as in various other countries.

It is obvious that to allow the necessary time for the charring the volume of the blast furnace must be comparatively greater for the same daily output than is required in the case of an ordinary blast furnace. At Corral for a daily output of 100 tons the dimensions are as follows:

Top	5 m. diameter (16 ft. 5 in.)
Belly	6 m. diameter (19 ft. 8 in.)
Hearth	2.25 m. diameter (7 ft. 4½ in.)
Total height =	25 m. (82 ft.)
Total volume =	492 cu. m. (17,360 cu. ft.)

The wood is loaded in lumps of irregular dimensions, none of the dimensions being larger than 6 in.

About 2600 kg. crude wood are burned for every ton of pig iron (probably 5800 lb. per gross ton). These 2600 kg. of wood treated in the ordinary charring furnaces correspond to a weight of

$$2600 \times 0.25 = 650 \text{ kg. of charcoal.}$$

The Prudhomme system consumes therefore the equivalent of 650 kg. of charcoal for one ton of pig iron, while the ordinary blast furnaces, treating the same magnetic iron ore, consume 1050 kg.

We can consequently say that the blast furnace with crude wood consumes 1 instead of 1.61, since $1050 \div 650 = 1.61$, which means an economy of about 40 per cent, and even more, since we must take into account the gas produced by the distillation of the wood within the blast furnace, which, as it is easy to calculate, affords for every ton of pig iron produced a heat equivalent of 500 kg. of wood or 125 kg. of charcoal.

Everything, then, taking into consideration the Prudhomme blast furnace, consumes in the ratio of 1 to 2 (since $1050 \div [650 - 125] = 2$) or in comparison an ordinary blast furnace consumes, per ton of pig iron, twice as much fuel as the blast furnace burning crude wood.

Basis of the Small Wood Consumption

The grounds for such a small consumption of fuel can be enumerated as follows:

1—All the sensible heat of the charcoal when

*Corral, Chile, South America.

charred is utilized, the charring being performed within the very same apparatus in which charcoal is burned.

2—All the waste of charcoal in handling is saved.

3—The charring is performed progressively, no part getting at red heat before complete charring. In this way the steam expelled from the inner part of the pieces of wood is not decomposed by the red heated carbon of the outer part of the pieces, as occurs with the ordinary charring process, and the yield in charcoal and by-products is very high. In fact, the fixed pure carbon produced is 30 per cent, instead of 20 per cent with the current charring equipment.

4—The exothermal reaction which takes place during the charring of the wood is fully utilized within the blast furnace.

5—The temperature within the shaft being comparatively low, since it is within this place that the wood distillation is performed, the combustion of carbon by carbonic acid is much less important than in ordinary blast furnaces.

6—The gases contain hydrogen proceeding from the distillation of the wood and the iron ore reduction is made easier.

7—The top temperature is only 75 to 100 deg. C. (167 to 212 deg. Fahr.). Consequently very little heat is carried away by the gases.

Other Advantages Enumerated

Besides the small fuel expense other advantages of the Prudhomme blast furnace are the following:

1—Elimination of the charring plant, which is expensive. Elimination of charring expenses, such as wages, fuel, maintenance and so on.

2—Possibility of collecting by means of an adapted cooler as completely as with the ordinary charring apparatus all the wood by-products.

3—The distillation gases used as fuel for charring when a separate charring plant is used increase with the Prudhomme blast furnace the calorific power of the blast furnace gases.

4—The upper charges within the blast furnace remaining a long time at low temperature and the pieces of wood of these charges being coated with tar rising from the distillation taking place at a lower level provide that the gases escape completely free of dust. The Cowper stoves never want cleaning. There is no flue dust and no scrubber is necessary. This means a great saving in the cost price of the plant.

The wood burning blast furnace makes all kinds of pig iron, from 10 per cent ferrosilicon to white pig iron with 0.30 per cent silicon.

Chilean Government Investigation

In July, 1920, the Chilean Government appointed a committee of civil engineers to supervise a test at Corral of the Prudhomme blast furnace system. The government wanted to be authoritatively informed about the working of this blast furnace before signing an agreement with the company owning the Corral plant. The committee delivered an illuminating report in the last days of October, 1920, with conclusions completely in favor of this system of blast furnaces, including the technical point of view of economy.

These conclusions are as follows:

1—Pig iron, gray as well as white, is produced in this blast furnace as easily as with the ordinary blast furnaces.

2—The cost price per ton of pig iron is lower than with any other system possible in Chile; 55 shillings (\$13.35 normal exchange), financial charges included, instead of 117s., which would be the price

with electric furnaces using the same materials, financial charges also included.

3—The cost price of the plant is lower than it would be in case of installing any other system.

4—The blast furnace gases have higher calorific power than with other systems.

5—The Chilean Government can fearlessly grant full help to the Corral Company, since the blast furnace used at Corral is the only one fitting in with the natural resources of Chile and allows an economical basis for the setting up of the steel industry in Chile.

One ton of wood with 15 per cent moisture is decomposed in the way indicated below when charred within the blast furnace.

Fixed carbon, kg.....	308
Ashes, kg.	8
Total solid products, kg.....	316
Moisture, kg.	150
Combined water; methylic, alcohol, acetic acid, tar, kg.	327
Liquid products, kg.....	477
Carbon monoxide, kg.....	69
Carbonic acid, kg.....	110
Hydrogen, kg.	20
Nitrogen, kg.	8
Gaseous products, kg.....	207
	1000

The wood with 15 per cent moisture contains 814 kg. cellulose per ton of wood.

With the preceding figures we can calculate the thermal balance for the making of 1 ton of pig iron under the following conditions:

Silicon of the pig iron, per cent.....	2
Slag per ton of pig iron, kg.....	250
Wood per ton of pig iron with 15 per cent moisture, kg.	2648

The limestone is useless for such a small quantity of slag, which it is easy to get, using again the very same slag. When so used, it is in a very small quantity, the wood ashes also bringing lime.

Thermal Balance (Computed in Calories)

EXPENDITURES OF HEAT:	
Radiation	340,000
Reduction of Fe_2O_3	1,801,000
Reduction of 20 kg. silicon.....	157,000
Fusion of 250 kg. slag = 250×500 =	125,000
Fusion of 1000 kg. pig iron = 1000×265 =	265,000
Weight of the Gases:	
Auxiliary blast to get the top dry, kg.....	900
Gases produced by wood distillation 2648×0.207 , kg.	550
Blast into the tuyeres, kg.....	3,760
Iron ore oxygen, kg.....	470
Carbon, kg.	775
Weight of the gases, kg.....	6,455
Heat taken away by the gases 6455×75 (deg. C.) $\times 0.24$	117,000
Weight of water brought by the wood 2648×0.477 = 1264 kg.	
Heat taken away by the steam 1264×625	790,000
Heat for carbon monoxide formation $2648 \times 0.069 \times 1032$	190,000
Heat for carbonic acid formation $2648 \times 0.110 \times 419$	122,000
Total expenditures, calories.....	3,907,000
RECEIPTS OF HEAT:	
Heat afforded by Fe_2O_3 reduction.....	1,467,000
Heat afforded by SiO_2 reduction.....	42,000
Heat afforded by hot blast $4660 \times 0.24 \times 600$ (deg.)	671,000
Combustion of the carbon 651 (kg.) $\times 2473$	1,610,000
Exothermal heat afforded by the cellulose decomposition 2648×814 (kg.) $\times 4000$ (cal.) $\times 0.035$	300,000
Total receipts, calories.....	4,090,000
Total expenditures	3,907,000
Surplus of calories.....	183,000

Therefore with 2648 kg. of crude wood per ton of 2 per cent silicon pig iron, there is a surplus of 183,000 calories, large enough to shield against working uncertainties, such as unforeseen stoppages, blast momentarily less hot, and so on.

Installing a Small Galvanizing Plant

Equipment and Materials Needed and Details of the Process—Precautions to Be Observed—Galvanizing Sheets

—BY J. R. WEMLINGER*

A FEW months ago the writer was called upon by a Japanese firm of exporters to advise them regarding the equipment necessary for the galvanizing of sheets and its costs for a given daily capacity. Investigation revealed that with the exception of a few articles dealing with special features of galvanizing plants, there could be found no complete description of such a plant. Another discovery was that, at that time, there was no manufacturer in this country equipped for or willing to undertake the building of a complete plant. One could furnish the galvanizing pots, the other the agitators, and so on. Consequently, the task of preparing a description of the process and specifications proved much harder than anticipated, and it was in hopes that this task might be made lighter to the searcher for information that these notes were prepared. The writer desires to give credit to a book by Flanders on "Galvanizing and Tinning" for the drawings of the tools and hood and much of the information used in the preparation of the report submitted to the export firm and which forms the basis of this article.

In fitting up a room or building in which to locate the galvanizing plant, it is important to have the best ventilation possible, and a good plan is to cover the kettles and acid tanks with hoods connected with an exhaust fan of suitable size and speed which discharges the fumes into a chimney. These hoods should be as low as possible over the kettles and tanks and large enough to project over the sides so as to catch as much as possible of steam and smoke. The hoods may be suspended from a carriage or trolley on an overhead track so that they may be moved out of the way. One of the accompanying illustrations shows one method of putting up a moving hood, although something better might be devised.

The equipment of the galvanizing plant consists of

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a kettle of suitable size, wooden tanks for water and the acid solution, tongs, hooks, etc.

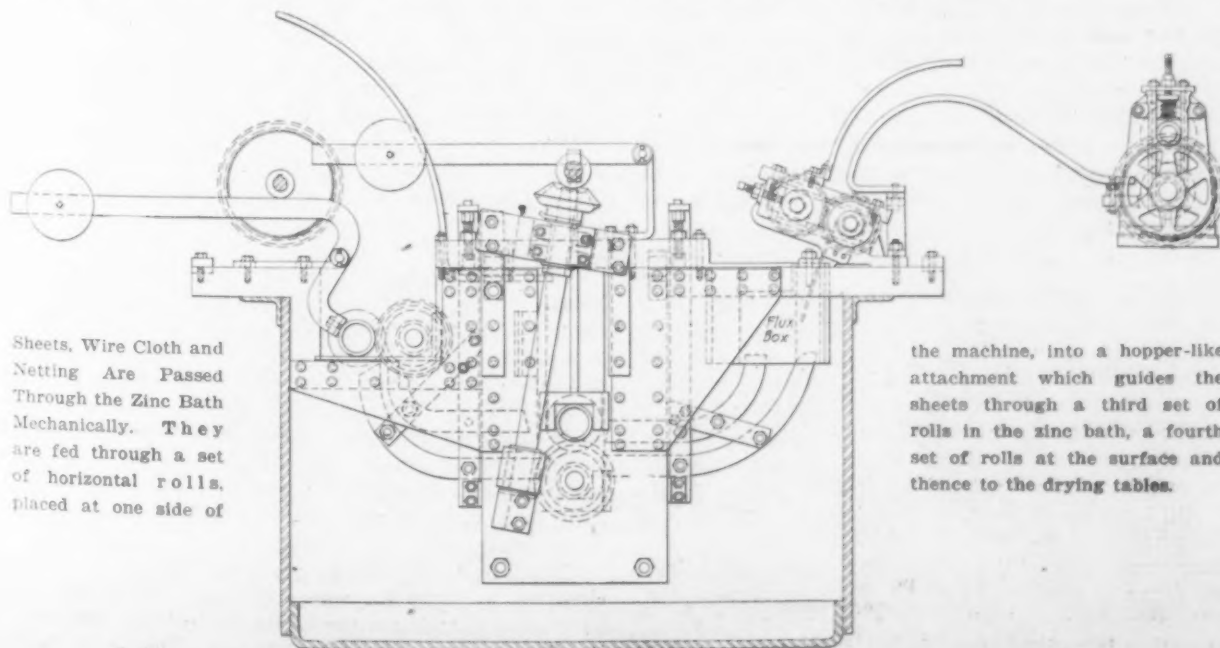
The material of the rolls, operating inside the zinc bath, is of the greatest importance. With the exception of lead and iron, all common metals are soluble in molten zinc, and the greater the percentage of impurities in such metals, the more they are soluble. For this reason, Bessemer and open-hearth steel go into solution much more rapidly than iron, especially the purer varieties. Consequently, it is recommended that these rolls be ingot iron, which is the purest obtainable commercial form of iron, and while the cost is somewhat higher than if steel were used, the increased durability more than offsets the additional cost. A recent investigation of samples of ingot iron and of steel showed a loss of 27 per cent to 41 per cent for the steel as against 11 per cent for the ingot iron after having been suspended in molten zinc for the same period of time.

The kettle, in order to keep an even temperature of the molten zinc, should be large enough to accommodate the sheets to be treated and also allow plenty of space, especially at the bottom, for the accumulation of dross. There are several fuels used for heating the kettles, such as soft coal, fuel oil or natural gas, but the most commonly used fuel is coke.

Tanks for Acid Solutions and Water

The best lumber for acid tanks is cypress, although pine is frequently used. Most galvanizing plants also use wooden tanks for the cooling water, although water tanks made of boiler plate will give good satisfaction and are more economical.

Wooden tanks for the various acid solutions should be held together by copper bolts, nuts and washers, or with steel bolts, etc., incased in lead for protecting against the acid. Such an acid tank is shown in one of the illustrations. It is a good plan to line the inside of such tanks with rough boards that can be replaced



Sheets, Wire Cloth and Netting Are Passed Through the Zinc Bath Mechanically. They are fed through a set of horizontal rolls, placed at one side of

the machine, into a hopper-like attachment which guides the sheets through a third set of rolls in the zinc bath, a fourth set of rolls at the surface and thence to the drying tables.

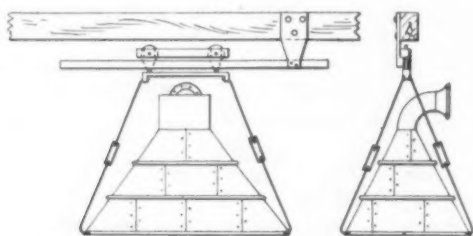
when worn out. As the sheets are moved about in the tank, they will naturally cut into the sides and thus if rough boards are used they will protect the tanks and increase their life materially. It is a good plan to coat the inside of wooden acid tanks with asphaltum applied as hot as possible with an old broom. If these precautions are taken, wooden acid tanks will give excellent satisfaction.

Materials Used in Hot Galvanizing

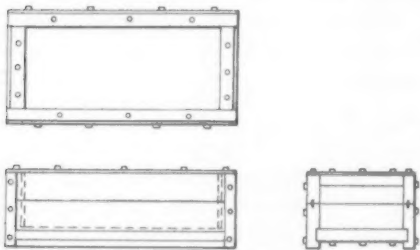
Virgin spelter smelted by a reliable firm should be used. What is commercially known as remelt spelter should not be used because it may not be reliable. The only positive way to determine whether such spelter can be used is through a chemical analysis. By using the purest possible spelter, one can be sure that no dross is introduced into the galvanizing bath at the beginning.

Scrap lead will answer every purpose for use in a galvanizing kettle as described in latter paragraphs discussing filling a new kettle.

Aluminum is commonly used in galvanizing baths to make the metal more fluid and to improve the appearance of the work. Its use has become so common



Front and Side Elevation of Movable Hood



Plan and Elevation of Acid Tank

that several concerns in this country now manufacture aluminum alloys or fluid metals for galvanizing purposes and each manufacturer has his own method for its application.

Sal ammoniac of the grade known as "gray granulated" is used for forming a flux on the surface of the zinc. This is necessary to facilitate the proper coating of the work and to retard the oxidation of the molten zinc by the air. White sal ammoniac is sprinkled on the surface of the molten metal as the work is withdrawn. These chemicals are an important item of expense and care must be exercised against buying inferior grades.

Zinc Ammonium Chloride a Substitute

The use of zinc ammonium chloride on the galvanizing bath as a substitute for the gray sal ammoniac is a comparatively new idea, and some of the best galvanizers give it preference, not by reason of economy, but from the standpoint of comfort. The fumes of zinc ammonium chloride are less disagreeable and less destructive than are the fumes of sal ammoniac, and in the opinion of these galvanizers it gives better results.

Oil is commonly used in galvanizing by floating it on the surface of the water in which the work is cooled after coming out of the molten zinc. Some galvanizers use different grades of fuel oil, but it is thought that better results are obtained by using mineral lard oil. The other ingredients used in hot galvanizing, such as

sulphuric and hydrochloric acids, are too well known to need any description.

Pickling the Sheets

Preparatory to galvanizing, the sheets must be prepared to take the coating. This is usually done by cleaning the sheets with acids, to remove scale and other foreign substances. This is called pickling.

If the sheets were simply immersed in the acid, the chances are that too much of the metal would be dissolved as the action of the acid is not uniform and the cleaning would be uncertain and uneven. Agitation is therefore necessary. This can be done by hand, although it is more economically done by mechanical methods.

In the modern galvanizing department at the Brier Hill company's steel plant sheets are deposited on edges in the pickling tank. The pickling solution consists of sulphuric acid, 5 per cent, and water, 95 per cent. The sheets are washed in tanks arranged with a mechanical agitator. After washing, the sheets are placed in storage tanks and immersed in water on cradles until ready for coating. This prevents the formation of oxide and keeps the surfaces of the sheets clear. It is a good plan to keep the water in these tanks hot by steam coils, so that the sheets will keep warm and thus dry faster.

From these tanks the sheets are removed on their cradles, and are deposited on tables at the side of the hydrochloric acid tanks. They are then sorted and deposited in the acid solution by hand. This solution consists of hydrochloric acid, 3 per cent, water, 97 per cent, there being one tank for each galvanizing pot. This removes the water rust and all traces of sulphuric acid.

In the removal of the scale with sulphuric acid, the trouble to be guarded against is over-pickling, which results from the material being placed into a too strong or too hot solution, or left in for too long a time. Over-pickling is being done when the fibers of the metal are visible.

If the plant is of a comparatively small capacity, mechanical means of agitating the sheets will hardly be justified.

Filling and Firing the New Kettle

Assuming that the galvanizing kettle has been properly bricked in, considerable care must be exercised in filling with spelter to prevent the kettle from being ruined when the fires are started. For that reason, a suitable quantity of lead should be put into the kettle to insure a depth of not less than 8 in. when molten. When dross forms in the process of galvanizing, this lead serves as a cushion for it to rest upon.

Lead and spelter do not mix under these conditions. The lead, being of a greater specific gravity, remains at the bottom and no amount of stirring can cause an appreciable quantity to be permanently mixed with the spelter. Furthermore, the lead not only serves as a cushion for the zinc dross, but facilitates the removal of the dross when necessary, and protects the bottom of the kettle.

In filling the kettle, the slabs of spelter should be placed on edge in such a way that their flat surfaces will lie as closely as possible to the sides of the kettle. This will materially lessen the danger of ruining the kettle at the first firing when there is cold zinc against all the heated surface. These slabs should be so arranged that, as the outward ones melt, those next to them will be forced outward against the sides of the kettle. New spelter should be added frequently and in small quantities so as not to cause sudden changes of temperature in the bath.

When firing the kettle great care should be exercised not to hurry the work; 36 hours at least should be allowed to melt out the kettle for the first time, and the fire should not burn too strongly. This is an im-

portant caution; otherwise, replacement of a burnt-out kettle may be necessary.

If it is desired to fire the kettle by means of fuel oil, it is suggested that seven burners be used, two at the back, one in front and two at each side. The method of bricking in will vary according to the type of burners used.

If oil burners are used, only those burners at the bottom should be operated at first, and as the metal melts, the side burners can be started so long as the metal is not more than 3 in. or 4 in. below the flame.

Temperature of the Zinc

The proper temperature of the zinc is a most difficult thing to maintain. Large pieces demand that the bath be kept at a low temperature. Small work requires a higher degree of heat than for galvanizing sheets which are drawn through the clear metal. The latter should have a slightly bluish cast. The zinc should burn sal ammoniac moderately quickly and show a film of oxide a few seconds after the skimmer has been passed over the surface. An experienced operator will be able after a comparatively short time to produce a proper degree of temperature for the work.

Before commencing to dip the sheets, part of the surface of the molten zinc should be covered with gray sal ammoniac or zinc ammonium chloride flux. To prepare this, a few handfuls of the salt should be sprinkled on the surface of the bath and as soon as it is melted a few drops of glycerine added. This will prevent the flux in a measure from covering the entire surface of the metal. The glycerine also causes the flux to remain stationary so that when the operator clears the surface of the bath, the flux will not cover the cleared space. It is important to keep the flux fresh by adding more sal ammoniac from time to time.

Galvanizing Sheets

Sheets, as well as wire cloth and netting, are galvanized by being passed through the zinc bath mechanically, the best method being to feed the sheets through a set of horizontal rolls placed to one side of the machine. These feed the sheets into a hopper-like attachment which guides the sheets downward into a third set of rolls located within the zinc bath, and finally up through a fourth set of rolls located at the surface of the zinc bath pot, and thence out to the drying tables. These rolls are usually driven by an electric motor. This machine is shown in an accompanying line drawing. It is not suitable for work other than sheets.

As it is necessary to pass the sheets into the zinc through a flux of sal ammoniac, what is known as a flux guard is employed. This guard is shown in the line drawing and is wide enough to go under the metal 2 or 3 in. when this is at its lowest working height.

The sheet goes into the flux box in a wet state and is, of course, seized by the upper set of rolls after which it emerges from the flux box on the other side. It is then seized by the operator by a pair of self-acting tongs attached to a rope running over a pulley.

The action of the rolls in the bath keeps up a constant circulation of the metal which, in a measure, prevents the dross from solidifying. The lower rolls operating within the pot are, of course, placed high enough to allow a considerable accumulation of dross at the bottom of the pot without interfering with the process. The amount of zinc per square foot of surface galvanized averages from one to two ounces, depending on the texture of the metal to be coated and the length of time immersed.

Zinc in the molten state will alloy with iron so that any iron submerged in the bath will begin to dissolve as soon as it becomes as hot as the zinc bath. The addition of as little as from 3 per cent to 4 per cent of the iron to the bath will form an alloy of zinc and iron

called dross, which, fortunately, is of greater specific gravity than is the zinc itself, and, therefore, sinks to the bottom of the kettle and becomes hard. When this accumulation has reached a point where it interferes with the work, it must be removed. This is easily done with a dross scoop. The handle of the scoop should be about twice the length of the kettle and should be well perforated with holes not less than $\frac{1}{2}$ in. in diameter, to allow the clear metal to flow back into the kettle, and care should be taken that these perforations are always kept open.

Before commencing to remove the dross, all the flux should be skimmed from the surface of the metal with a perforated skimmer and if in good condition saved for further use. If this flux is broken up when cold and placed carefully back on the surface of the zinc, it will soon melt to its former consistency.

The loss caused by the formation of dross is quite large even with an experienced man in charge of a kettle, and the only way to maintain this at a minimum is to keep the metal at a temperature which will not be too high, and by leaving no work in the bath longer than is absolutely necessary.

Sal Ammoniac Skimmings

Flux which is no longer useful must be removed. This is called sal ammoniac skimming, and is the thick, dirty portion of the flux left on the bath after the work has been going on for some time. Too much care cannot be used in skimming the spent flux, as a considerable amount of zinc might be carried off by carelessness in this respect without its being noticed, and this would constitute quite a loss.

A skimmer with $\frac{1}{4}$ -in. perforations should be used for this purpose and must be kept clean. The handle of the skimmer should be tapped on the edge of the kettle while filled with hot flux to shake out as much of the free metal as possible. In a plant having several kettles in operation, considerable zinc can be removed from sal ammoniac skimmings by remelting in a large mass, but it is not economical for a small plant to attempt this removal.

Zinc ashes is a trade name for zinc oxide, which accumulates on the bare surface of the molten zinc. These ashes are formed by continually skimming the surface of the bath and by the melting of new spelter. Of course, it also collects when the bath is lying idle, as on Sundays and holidays.

Before removing the ashes, a little white sal ammoniac should be sprinkled over and well stirred into, the ashes with a poker or skimmer to reduce the particles of metallic zinc in the oxide to a molten state. Another good plan is to throw a few handfuls of resin on the bath and light this by a match or other flame. The resin in burning creates considerable heat which melts the zinc in the ashes and allows it to trickle down into the bath. The ashes should be raked over with the skimmer while the resin is burning. Plenty of time and care should be used in skimming to avoid loss. These ashes or oxides are largely used by paint manufacturers and should find a ready sale.

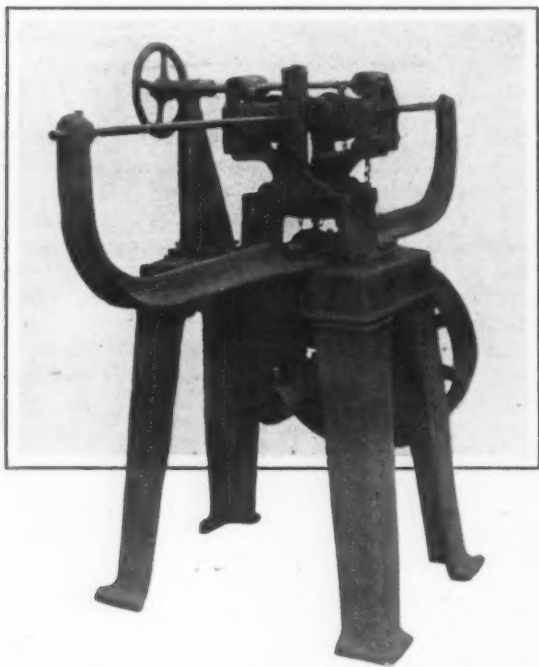
Repairing Old Galvanizing Kettles

Kettles are good until they begin to leak badly or have become so warped or distorted that they cannot be used satisfactorily. The life of a kettle ranges from a few days or a week to several years, depending upon whether it has had careful and intelligent operation. Kettles that develop a leak, and which are otherwise in good condition, may be repaired by a patch, riveted, welded or attached by some other method. If, however, an old kettle that seems to be generally worn starts to leak, it is more economical to replace it with a new one. It is a good policy to have a new kettle on hand for emergencies.

Straightening Machines for Round Stock and Stampings

A No. 00 rotary straightening machine for handling round stock either tubes or solid bars in sizes from 3/32 in. to 5/16 in. in diameter, and a No. A straightening machine for hack saw blades, file blanks, knife blanks or other material of like nature that are stamped out of flat sheets, and which need to be straightened cold both before and after they are tempered, are the latest developments of Kane & Roach, Syracuse, N. Y.

In the No. 00 rotary straightener, stock is put into the machine through a tube and passes through into the rolls in the center of the machine. Two rolls, one convex and the other concave, are placed at such an angle and are so shaped that the rolls revolve the material and feed it through automatically. Capacity for straightening round stock is given as 50 to 75 ft. per min. It is explained that the machine will handle pieces from 8 in. to 30 ft. long if necessary, but the usual



sizes range from 3 ft. to 10 ft. The hand wheel on the side of the machine adjusts the roll for any diameter within the range of the machine.

The advantage emphasized for the No. A straightener is that it will handle short pieces, such as file blanks, knife blades, etc., from 3 in. up, and provides for the usual variations in thickness, bends or curvatures and temper encountered in such pieces. It is a 4-roll machine and all the work is done on the rolls between the housings. The upper rolls are adjustable and these rolls as well as the lower rolls are gear driven. The first upper roll takes out the bends, while the last upper roll does the actual straightening. The rolls are made with seven sizes of steps. When the machine is set up for any particular size or thickness, it is usually set for the middle step to bring the work out right, and then this allows three graded steps to the right and three to the left of the center step, thus providing for variations in thickness, curvature and temper.

Poldi Steel Corporation of America

The Poldi Steel Corporation of America has been established to handle in this country the products of the Poldi Steel Corporation which has two plants in Czechoslovakia, one at Kladno and one at Komotau. The American company has been organized by J. B. Smiley, president Smiley Steel Co., 115 Broadway, New York. The company has opened a warehouse at 173 Spring Street, New York, to carry stocks of high-speed and tool steels, alloy and other special steels, drill rods, spring steel and machinery steel. George H. Grundy, for many years manager of the New York

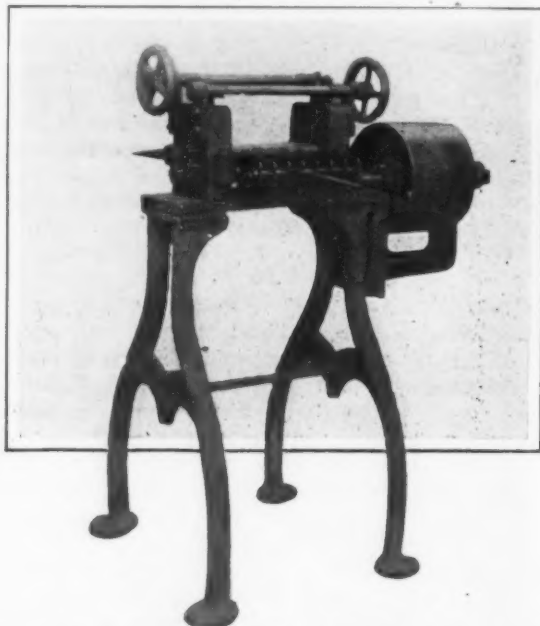
branch of the Crucible Steel Co. of America, has been appointed general sales manager of the Poldi Steel Corporation of America, with headquarters at 115 Broadway, New York.

Foundry on Repair Ship

An interesting foundry installation on the U. S. S. Prometheus, repair ship of the Atlantic Fleet, was described in a paper by Lieut. R. F. Nourse, United States Navy, at the annual meeting of the American Foundrymen's Association, Columbus, Ohio, Oct. 4 to 8. There are six Monarch tilting furnaces, two of 120 lb., two of 200 lb. and two of 300 lb. capacity. These furnaces are oil fired and are provided with hoods for gas escapes. There are three Whiting cupolas, one No. 0 of 1/4 to 1/2 ton capacity, one No. 1 of 1/2 to 1 ton capacity and one No. 2 of 1 to 2 tons capacity. Forward of the furnaces and cupolas is the molding floor in the center of which is a sand pit, 6 1/2 x 14 x 18 ft., used for making large castings. A metal store room, two core ovens, a work bench for the core makers and electric

Straightening Machine, at the Left, for Short Pieces, 3 In. and Longer, Such as File Blanks, Knife Blades, etc., and Designed to Provide for Variations in Thickness, Curvature and Temper

Rotary Straightening Machine, Below, for Round Stock, Either Tubes or Solid Bars, in Sizes 3/32 In. to 5/16 In. in Diameter



blowers for the cupolas are provided, also a loading platform for the cupolas and a pattern shop.

The largest casting was for a low-pressure piston ring, 73 1/2 in. in diameter. Pistons of various sizes were made, the largest being a bull ring of 44 in. diameter. The largest single iron casting weighed 2100 lb. and was for a bending slab for the welding shop, and the largest composition casting was for a main shaft steady bearing and weighed 900 lb. The maximum output was recorded Nov. 8, 1918, when 1359 iron castings weighing 59,589 lb., and 518 brass and composition castings weighing 4302 lb. were made.

The Waterbury Mfg. Co., the Chase Metal Works, and the Rolling Mill, all Chase-owned plants, Waterbury, Conn., have instituted a rather elaborate plan involving six departmental committees for the purpose of co-operation between management and employees. Under these six departmental committees, there will be sub-committees. The whole plan is a consolidation of various welfare plans that have been successfully worked out in other sections of the country.

The Sharon Pressed Steel Co. is reported to have received an order from the Haynes Automobile Co. for 500 automobile frames a month. The company operates a plant at Wheatland, Pa.

Improved Mining Methods in Iron Ranges

Important Results Obtained by the Mesabi Iron Co. — Decision in Steel Corporation Suit Approved—Gogebic Makes New Record

—BY DWIGHT E. WOODBRIDGE, E. M., DULUTH, MINN.—

YEAR by year Lake Superior iron ore operators widen their viewpoint, enlarge the scope of their operations, improve their engineering, add weight to their machines, and eliminate manual labor. The change is especially noticeable in seasons of high wages, consequent inefficiency of men, and demand for product. This drift is less in years when men are plenty, their pay less and their willingness to do a day's work naturally improved. So 1920 has been marked by the completion of many steps toward greater effectiveness of operations. Were the Panama Canal to be dug to-day, in the light of the experience of the Mesabi range as it now is, no doubt vast sums would be saved and that great work could be completed in half the time that it actually required.

Consider the 75-ton ore-carrying railway car with its quick dump, running in train units of 100 cars drawn by one Mallet locomotive; the advances in mechanical underground loading; the 20-yard air dump stripping car; the mine pit locomotive of more than 200,000 lb. on drivers, with the heavier and more permanent trackage demanded by such units; the 300-ton electric shovel in pits; the use of the caterpillar tractor for many services; the attention to detail evidenced by the intensive study and adoption of the so-called "slushing" method of underground mining; by the installation of underground ore sorting and crushing; of revolving tripplcs—not new in principle, but advanced in type—the big mechanical spreader for stripping; the method of track moving by the use of locomotive cranes; the 100-lb. rails in pits, together with other changes in detail too numerous to refer to here. Appreciate the fact that a 300-ton shovel will work two years before its loading track will have to be moved and that it will take out 3,000,000 yards of material in that time, and one will gain an idea of the advance from the time when track crews were continually in attendance moving and shifting rails. All these things are having their great effect in neutralizing the scarcity of men and their recent but now overcome disinclination to deliver a fair day's work for the highest wages ever known.

New Source of Income

For the first time in its history the State of Minnesota has received this year, as income from ore mined on lands belonging to its public schools, the royalty on more than 5,000,000 tons, about 5,500,000 tons, to be exact. This was due in large part to the Missaba Mountain mine, a State-owned property that contains more than 60,000,000 tons of ore and the lease on which is shortly to expire. This ore all pays 25c. a ton to the public funds and will be mined as rapidly as practicable, probably at an average of not less than 3,000,000 tons per year.

Operations of Mesabi Iron Co.

During the year, D. C. Jackling, president of the new Mesabi Iron Co., and Hayden, Stone & Co., its financial sponsors, issued that company's first statement of its intentions and published the details of its organization. The company has been busy during the year in the construction of its first mill unit, at Babbitt, eastern Mesabi, and this is now more than 50 per cent completed; its operation is predicted for early in the season of 1921. Up to date, the company has spent in construction about \$1,500,000, besides some \$750,000 prior to organization in land purchases, explorations and experiments. Mr. Jackling expects its plant to develop into what will be by far the largest metallurgical mill in the world, and that at no very distant day. A recent experiment in excessively fine grinding on its ore resulted in the production of a concentrate

assaying 71.96 per cent iron, and this concentrate, which was minus 300 mesh, was sintered without difficulty and by the use of soft coal. Doubtless many metallurgists will be astonished at this statement. The School of Mines of the State, which conducted this experiment, is doing commendable work on various types of low-grade ores, to fit them for the blast furnace. So is the State mining engineer's office. Both are looking to the time when rich ores will exist in Minnesota in comparatively small quantities, a time that is not far distant. The peak of the State's annual production is nearly reached. The chief incentive to this sort of work has been the result of the intensive and scientific study carried on by the Mesabi Iron Co., but the State has been continuing and extending it, and is sure to get important results.

New Record for Ship Loading

What is known to be the fastest record of ship loading ever accomplished was in Duluth harbor in July last, when the steamship Kerr, of the United States Steel Corporation fleet, took on 12,689 gross tons of iron ore in 35 minutes, and was inside the harbor but 185 minutes, all told.

The year has seen heavier shipments than were looked for at the beginning, not so large, perhaps, as hoped for a few months later when business seemed to be limitless. For the years since the world war upset things, the figures of Lake ore shipments have been as follows:

Year	Tons
1914	32,729,726
1915	47,272,751
1916	66,658,466
1917	64,437,003
1918	62,836,172
1919	48,812,522
1920 (estimating all rail ore)	60,000,000

The Rate of Progression

It is interesting to note from the above figures that the rate of progression has been about the same for the past seven years as it has averaged since the beginning of the Lake Superior field as an iron ore producing district. This progression has shown a doubling of the shipments every 6.2 years, having doubled almost 10 times since the shipment of 68,000 tons in 1859. According to the arithmetical progression, that 68,832 tons will become 70,483,968 tons in 1921, and should the business of the coming season show such a total, the average time of doubling will be precisely 6.2 years. It is improbable, of course, that such a total will be reached in 1921, but the time when it does come is not far distant.

Mining Companies Become Sellers

During the year several mining concerns have become their own sales agents, pursuing a policy that would seem to offer advantages of independence. It is a curious fact and one that is unique to the iron ore trade that the sales of product have always been, and still chiefly are, in the hands of those whose interests are largely on the buying side, and it is fortunate that, so usually as to have become the rule, these concerns are of the highest principles and integrity. But the situation presents its dangers, and for a long time these have been recognized. It is certain that the movement toward independent selling by miners will grow and become, if not general, at least common.

Legal and Legislative Features

The legal and legislative aspects of the ore situation have been prominent during the year. In March the United States Supreme Court refused to dissolve the Steel Corporation, an opinion that was hailed with

joy by the mining fraternity in general, for it would have been a calamity to the lake region had the decision been otherwise, and would have led to interminable disputes and difficulties.

The suit of Alexander McDougall, of Duluth, against the Oliver Iron Mining Co. for \$2 per ton damages on the 20,000,000 tons of ore it had treated at its Coleraine plant, was tried. No decision has been announced. If the plaintiff wins, every ore washery in Minnesota, excepting one, will be subject to the same charge. Suit has been entered by the fee owners of Thompson mine, Cuyuna range, against its late lessee operators, alleging improver mining, etc. Heavy damages are claimed. As time goes on and operating companies more and more frequently abandon or exhaust their leases, these suits will become increasingly multitudinous and endless. No doubt there have been many cases where mines have been run without due regard to the rights of the lessors, but this is less the case now than formerly.

The fight of Western steel consumers and States against the "Pittsburgh base" for steel prices was won, as to the first round, by the defendant steel makers, but another hearing has been held, and it is generally believed a complaint will issue.

In an effort to make head in Minnesota against the tonnage supertax idea, residents of the northern part of the State have at least done what they should have been engaged in long ago—a comprehensive scheme of education as to iron ore matters. It is perhaps too late to avert some sort of supertax, but the work now done will make it milder than it might have been. Taxes on mines in Minnesota are so heavy, averaging about 50c. per ton on all ore mined last year, that it will not be unexpected if mining companies make a very thorough effort to find available deposits elsewhere. That such exist is well known. Canada is attempting a different policy toward the industry, and there is much agitation there in favor of a bounty on ore mined in the Dominion, the proposals being for a bounty of 75c. a ton on all ore mined, whether for direct shipment or to concentration works, for a period of 15 years. As practically all the known iron ores of the Dominion are low grades, requiring beneficiation, this will mean a high bounty on shipping concentrates. It is considered doubtful if the agricultural interests of the Dominion will permit the passage of such legislation.

An Important Development

What is called the slushing system of mining is perhaps the most important thing of the year in underground technique. It will lead to a change in underground practice, not only in the lake region but elsewhere, on the part of those who want to be classed as up-to-date and economical producers. To appreciate its place, one must realize that for many years shoveling or mucking has been the *bête noire* of all studious operators, and that less advance has been made in this particular work than in any other of the many in what may be called the cycle of operations underground. True, the mechanical mucker has come recently, and a tremendous amount of attention has been given it, with the result that there are now on the market and in successful work at many places various machines that do by power what used to be done by hand at great expense of time and energy. But the power shoveler is a heavy and rather unwieldy thing, requiring considerable space, and it is adapted in chief to main levels and large openings. It is not well suited to subdrifts, or in any location of the mine where room is at all restricted. And it is in the subs that the ore is won. What may be called a typical work cycle in a Lake Superior underground mine, and for that matter anywhere else, is about as follows, varying, of course, with nature of the rock:

Operation	Per Cent of Time
Drilling	10 to 50
Shovelling or mucking.....	40 to 60
Tramming	2 to 5
Incident to blasting	5 to 7
Timbering	5 to 15
Pipe fitting, track laying, etc.....	2 to 5

In other words, more time is spent in shoveling than in anything else, and about as much as in all other

items combined. Not only this, but it is hard manual labor and calls for the particular class of men that of late has been hardest to get and most difficult to handle. Hence any device that saves in this end of the cycle will be welcomed and will have a permanent place. Experiments in slushing by the Oliver Iron Mining Co. during the past year have shown an increase in efficiency amounting to about 33 per cent per man underground.

Slushing consists essentially in so arranging the raises conveying ore to the main drifts and in so conducting mining that ore is brought to the raises by scrapers worked by small hoists, employing but one man. These scrapers are attached by cables to the hoists, which are preferably double drums with clutch throwing either one in or out. The hoist is attached to a timber, and the work may be facilitated by the addition of a boom swinging in as wide an arc as the space in which it operates permits. The hoists are either air or electric, have from two to three horsepower, give a rope speed of from 100 to 150 ft. per minute, and they have capacity for a load of from 1000 to 1500 lb.

The 300-ton shovel or dragline, equipped for field control, rather than rheostatic, such as has been installed at Wabigon mine by the Marion company, is another great advance of the year. At this time the overburden is difficult, being full of boulders and hard, but the dragline is working satisfactorily. The machine has a greatly increased radius of action, the point of the boom swings through a radius of approximately 155 ft. and the bucket can be thrown into a wider radius. All the electrical equipment is of a new and improved design which is proving successful in action.

Exploration Not Extensive

Exploration in the lake region has been slight; most of it has been in other States than Minnesota, where the tax situation does not stimulate the development of new tonnage. There has been much work on the Mesabi in the way of opening formerly known deposits. Early in the year the Cleveland-Cliffs company began work at its new Boeing, where 6,000,000 yd. were to be stripped. A 300-ton shovel was put at work and mining will begin in 1921. The ore lies at a depth of about 130 ft., the grade and quantity of ore are medium, and the life of the lease is brief. Recently at this property a runner loaded 357 16-yd. stripping cars in a 10-hour shift, using a 300-ton Marion shovel. This is considered a record. The Oliver Iron Mining Co. is opening several mines to replace the vast exhaustion taking place at its various properties; among these are Wellington, underground, at Chisholm, and Frazer, same place, an open pit from which some 2,000,000 yd. of overburden is to be taken. These mines are of the Burt leases, and are intended to continue the Burt minimums of 3,000,000 tons annually, as shipments from other Burt properties diminish. The same company is taking 2,500,000 yd. of its Bovey-Judd property near Coleraine. Sargent, at Keewatin, of the Wisconsin Steel Co., has had some 1,300,000 yd. removed during the year. Webb and Schley, of Republic Iron & Steel Co., have been reopened. Shada, of C. K. Quinn & Co., is the first successful underground concentrating proposition in the region, and has made a most satisfactory record. Wabigon, leased from the Great Northern by a Hanna company, is being opened for heavy mining and a 300-ton electric shovel is working these. Tod, Stambaugh & Co. are now operating nine large mines, most on the Mesabi and Cuyuna, and are far larger operators than ever before. They are exploring west of the Mississippi river, on lands formerly held by Jones & Laughlin. The Hanna Furnace Co. has taken over a number of mines including those of the Hollister Mining Co., on the Menominee, and of the Hanna Ore Mining Co., on the Mesabi. The Hanna and Pickands, Mather & Co. interests still continue the chief operators in the Lake Superior field, aside from the Oliver company. While both are most heavily entrenched on the Mesabi, they are large operators in almost every other lake district.

The Year on the Cuyuna

Cuyuna range has had a fairly satisfactory year, with shipments approximating 2,000,000 tons; but it is now very quiet, as a number of its small underground

manganiferous properties are idle. Its Rowe mine, leased by the Pittsburgh Steel Co., has been finally abandoned and wrecked and the pumps were taken up in December. During its somewhat checkered career this mine has produced nearly 1,000,000 tons, but at a cost for development that is said to have aggregated not far from \$3 per ton. While there is some ore left in the deposit, it is not believed to be enough, nor of quality sufficient to permit profitable continuance. The peculiar history of this mine, at one time stated to contain up to 100,000,000 tons of ore, is one of high finance rather than of mining. Thompson mine, also, has been abandoned as exhausted. A number of weak independent operators have been eliminated during the year, while those more able financially have expanded their operations. Among these latter have been the Mahnomen Mining Co. (C. K. Quinn), Coates & Tweed, and John A. Savage. The latter is developing Sagamore mine into a large potentiality; it is to have a plant to crush, dry and sort for shipment. This will be the last year of Pennington (Tod, Stambaugh & Co.) as an open pit. Maroco (Breitung interests) is being developed as an underground concentrating proposition, and with hopes that it may produce a high grade Bessemer ore. Its plant is designed to handle up to 3000 tons crude ore per day. Interests connected with Northland mine have gone into the manganese game at Batesville, Ark., with very favorable prospects. The manganiferous ores of the Cuyuna district are holding their own and seem to have made their place for a permanent demand of considerable quantity. The stability of the district has been improved by greater experience in the metallurgy of its peculiar ores and also by further knowledge of the nature of its geology. The district has no new producers and there is no great change in the general situation affecting it.

The Vermillion Range

On the Vermillion, Zenith mine, the lease of which was given up by the Oliver company, has come into the control of Pickands, Mather & Co., under what is probably the highest royalty paid in the Lake region, amounting in 1920 to about \$1.60 per ton. The mine was well developed when taken over, contains a large tonnage of very fine ore of a type that is needed. Soudan mine of the Oliver company is down to 1800 ft., and some magnificent hard ore of remarkably high grade has been found this year on the bottom levels. Development of new mines does not proceed favorably, although there is no doubt that exploration on this range will increase in activity and extent as time passes. Its area is larger than most of the districts about the lake, and its rocks are favorable for ore, but the geology is complex and knowledge, ability and money are requisite for success in exploration. In most cases exploration companies there have not been blessed with a superabundance of any of these necessities. Therefore a melancholy record of far too costly failures is still growing.

Gogebic Surpasses Records

The Gogebic has surpassed all preceding shipping records with a tonnage of about 8,000,000 for the year. The range is continually developing in depth and its importance is, even now, scarcely appreciated. The several Oliver mines in the vicinity of Ironwood are equipped with new footwall steel and concrete shafts to great depths, and the mines are operated electrically throughout, the installation being recognized as in advance of anything so far undertaken in the United States. The company now has five concrete shafts varying to 2600 ft. in depth, equipped with electrically driven hoists. Mines of the Steel & Tube Co. of America have been making records of hoisting 2500 ft. at the rate of more than 100,000 tons per month from single shafts. At Ironton (McKinney Steel Co.) a 1650-hp. motor has been installed, the largest in the entire region. The district has been shipping all rail to St. Louis this season.

Ford on the Marquette

On the Marquette, American-Boston has finally closed, probably for all time. The Ford Motor Car Co. interest has reopened old Imperial, near Michigamme, a property abandoned years ago, when it had some

1,500,000 tons estimated and was 200 ft. deep. Its ore was lean, running about 46 per cent. The new owners will explore and develop and use their ore at Detroit. They control the lands of the Michigan Land & Iron Co. and will carry out an exploration campaign thereon. Isabella, a comparatively small mine near Negaunee, has been taken over from the Longyear & Bennett interests by the Steel & Tube company. All Cleveland-Cliffs mines in the district except one are now electrically operated. The company goes into the new year with more than 1,000,000 tons of ore in stock, an unusually large quantity.

Electrification of Operations

Electrification is the order of the day on all ranges where power can be developed. On the Menominee the Oliver company is increasing the height of its Quinnesec dam and will make improvements to cost some \$3,000,000, for additional power for its mines in that region. All the mines of the McKinney Steel Co. in Crystal Falls and Iron River will be electrified. There is much exploration and reopening of old mines on the Menominee. This is particularly true of the country about Crystal Falls and Iron River. Four or five of the large companies are operating there.

Operations in Other Fields

A very brief statement of some potentially important developments elsewhere may be permitted: A French syndicate is exploring a large area on the west African coast, near the equator, where are great areas overlain by residual limonites somewhat similar to the ores of the north coast of Cuba, at Mayari and Moa; this work will take a long time, but the tonnage to be looked for is vast. A truly Mesabi range type of ore formation in several times the Mesabi range area has been found close to the sea in Hudson's Bay, in such a situation that it is competitive, providing grades of ore exist that equal, say, average Lake Superior grades; conditions seem to be such as to have favored the deposition of commercial ores, but no drilling has yet been done. This will be carried on, without doubt, in the near future. The possibilities are too tremendous to be neglected. High-grade ores have been found on the Isle of Pines, but engineers who have examined them fear for their quantity. They differ from the ores of the neighboring island of Cuba. A few weeks ago newspapers had much to say about a new Mesabi range that had been found in Oregon. Ore exists there, but it is not a new Mesabi; it is of the residual type frequently found in the tropics, but seldom elsewhere, and the quantity is yet to be determined. Efforts to develop the surface ores of northeastern Texas, in Cass and other counties, are now under way. These ores exist in quantity, over a very large area, but many problems have been serious enough to have so far prevented development. Whether or not this latest attempt will be successful remains to be seen. A concentrating mill is under construction and will be working experimentally in a few months.

At New Castle Junction, near New Castle, Pa., a site of 168 acres of swamp land is being reclaimed for industrial purposes by the J. C. Barr Co., by filling with waste slag, ashes and cinders, distributed by powerful hydraulic pumps. The material is transported to the site in gondola cars from steel mills at Youngstown, Ohio, and McKeesport, Pa. It is estimated the work will require from four to five years for completion and will use from 150,000 to 200,000 tons of mill waste. The cars of waste are run to trestles of suitable height, from which the material is shot out in all directions by means of hydraulic pressure. Cars are being handled at the rate of 100 a day, and the number of carloads of slag and cinder that have been deposited has passed the 15,000 mark.

The United States Civil Service Commission is inviting applications for examinations as instructors for the Army at salaries from \$1500 to \$3600. Among the instructors desired are those for occupational training, two of its 17 branches being classified as metal and machine. Application for Form 1312 should be made before Feb. 1.

CONCRETE FOUNDRY FLOORS

Precautions to Be Observed to Attain High Compressive Strength—Determining Water Ratio

Methods of preparing concrete foundry floors to prevent complaints usually justified because the floors are not properly made were contained in a paper presented by H. C. Boyden, Portland Cement Association, at the annual meeting of the American Foundrymen's Association, Columbus, Ohio, Oct. 4 to 8. The paper in part was as follows:

In general the floor should not be less than 5 in. thick, and in foundries making heavy castings the thickness should be 7 in. Concrete with a compressive strength of 3000 to 5000 lb. per sq. in. can readily be made if a few simple but important rules are followed. The first is that an analysis should be made of the aggregate—sand and pebbles or broken stone—that is to be used, and the proportions that will give the greatest strength be determined and adopted. There is only one such proportion for each aggregate and it can readily be found. "Abrams' Table of Proportions and Quantities" has recently been published and gives full information on this point.

The second rule is to use just as little water in mixing the concrete as possible, and at the same time have a workable, plastic mixture. Up to a certain point the compressive strength of concrete increases as the water ratio decreases, and the limiting water ratio is considerably below the ratio required to give a workable, plastic mixture. The water ratio is always figured as gallons of water to one sack of cement.

The proper water ratio varies for different aggregates and mixtures so that it must be determined for each case. To determine it a simple test, called the "slump test," has been devised. "A frustum of a cone 4 in. in diameter at the top, 8 in. in diameter at the bottom and 12 in. high, made of sheet metal, is filled with the concrete to be tested, which is placed in the casing in layers, and carefully worked with an iron rod while being placed. The casing is immediately lifted off and the settlement or "slump" is measured. For a foundry floor the proper slump is between 1 in. and 1½ in. A greater slump indicates the use of too much water.

Determining Amount of Water

As a guide in determining the proper amounts of water to be used the following approximation may be useful: With a 1-2-4 mixture use 6 to 6½ gal. of water for each sack of cement; for a 1-2-3 mixture use 5¼ to 6¼ gal., and for a 1-1½-3 mixture, use 5½ to 6 gal.

The third rule is to mix the concrete thoroughly; if a mechanical mixer is used, it should be turned at least one minute after all the ingredients, including the water, have been placed in the drum. If the concrete is mixed by hand, it should be turned at least five times on the mixing platform. Machine mixing is advisable because of the uniformity of the product thus secured.

For a foundry, a concrete floor should be built in one course and should either be continuous or in sections without expansion joints, except that if desired, joints may be made next to the building walls. If the building is divided into bays by columns, each section may cover an entire bay; the floor can be laid in alternate bays and the omitted bays filled in after the first ones have hardened.

How to Increase Strength of Floor

The floor should not be troweled with a steel trowel, but should be rolled with a steel roller 8 or 10 in. in diameter, about 6 ft. long, and weighing about 100 lb. This rolling will add greatly to the strength of the floor by squeezing out any excess water, thereby reducing the water ratio. Suitable protection for the floor during its early hardening period should be provided, as this greatly influences the compressive strength and resistance to wear.

In order to attain its maximum strength and hard-

ness a concrete floor must be kept warm and damp during this period. Covering a concrete floor with damp sand, as soon as it has hardened sufficiently, and keeping it damp by frequent sprinkling for the first 10 days will increase its compressive strength over 75 per cent and its resistance to wear over 40 per cent. Still better results will be secured if this protection can be continued for three weeks. It is best not to use the floor until four weeks after it is laid.

Moisture Only Cause of Spalling

The question of whether the surface of the floor will spall when molten metal is spilled upon it is not serious. It would be well, however, to avoid the use of granite or quartz gravel aggregates in the construction of such floors, because those materials do not stand heat as well as certain other aggregates. Trap rock possibly makes the best aggregate for resisting heat, and slag, limestone, or limestone gravel may be used with excellent results.

Hot metal where spilled on a concrete floor will not pop unless the floor is wet or the concrete contains moisture. A concrete floor can become moist in only two ways: First from water spilled on the surface, and second by absorbing water from the ground beneath. The spilling of water on the floor surface is under the control of the shop foreman and of the molders themselves, and the results, viz., the popping of spilled metal, will be the same no matter what type of floor is used. The second cause of moisture in a concrete floor, absorption from the sub-base, can be avoided by properly draining the sub-base and spreading a few inches of porous gravel, cinders or other suitable material over the ground before laying the floor. Furthermore, if the concrete is properly made, it will be watertight and will not absorb water in this manner.

Dull Days in the Coke Regions

UNIONTOWN, PA., Jan. 10.—The first ten days of the new year have been marked by continued depression in the Connellsville bituminous region, in so far as the independent operators are concerned. The H. C. Frick Coke Co., however, continued to put in more ovens and increase its output of coal, its operations now being around 90 per cent, as high or higher than for many months.

The Oliver-Snyder Steel Co. is operating at lowest ebb for many years. One plant is reported down entirely while the two others in the county are operating not more than two days a week. W. J. Rainey operations are reported fair. Some of the others of the larger companies in the region are making efforts to operate at least two days a week during the readjustment, but this program is not entirely followed out. A large number of the independent operators have closed their plants entirely. In a few instances, reports have been received of operators bargaining with labor for a readjustment whereby operations of the mines could continue. The American Manganese Co., employing 450 men, at Dunbar, this county, announced a reduction of 25 per cent, effective Jan. 1. The men have raised a vigorous protest and only a few have returned to work, it is reported. The plant, however, has curtailed operations temporarily.

There is no coal or coke market, shipments of spot product being almost negligible. Suspension of contracts continues in order as pertains to coal. Only one contract for coke for the new year, of any importance, has been reported. The Washington Run Coal & Coke Co. has contracted for its first half year output on the basis of five to one between coke and pig iron, with a minimum of \$5.80. The company is operating at full capacity. Old officers were re-elected at the annual meeting this week. M. M. Cochran, of Uniontown, is president; W. Harry Brown, of Pittsburgh, vice-president, and J. H. Price, of Dawson, secretary.

The Kewanee Boiler Co., Kewanee, Ill., has announced reductions of 10 per cent on all fire box heating boilers and 20 per cent on steel tanks used for pneumatic water supply purposes.

Building Workman Morale by Advertising

Employees of Dodge Mfg. Co. Inspired to Make Good the Tribute Paid in the Company's Advertising—Use of Billboard

BY HARRY BOTSFORD*

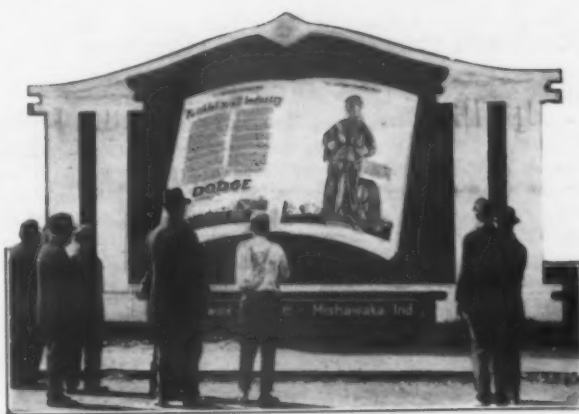
INCULCATING upon its workmen a feeling of personal responsibility for the quality of its product has been attempted in a novel manner by the Dodge Mfg. Co., Mishawaka, Ind., maker of pulleys and power transmission equipment. First, the company ran an advertisement in the national magazines, the gist of which was that a product made by conscientious, faithful and long-skilled workmen was bound to be reliable. Next, the company constructed a large bill board on which was reproduced such an advertisement and placed it at the entrance of No. 1 plant. This advertisement was one of the finest tributes any organization ever paid publicly to its employees. To read would cause the workman to strive to live up to that tribute. It would tend to stimulate morale and pride of craftsmanship.

During the company's 1920 advertising campaign, it had released nearly all of its advertising with a strong "worker-motif"—that is, the organization had originated an entirely distinctive type of industrial figure, a representative Dodge workman. "Shorty" is a mechanic in one of the Dodge shops and is a real flesh and blood individual. The text of the advertising dwelt, in many cases, on the tremendous asset Dodge had in its thousands of contented and honest workmen—real artisans who slighted no detail in their work. These advertisements accomplished their purpose in one direction as they succeeded in selling the product advertised.

But the Dodge people realized that unless they kept the employee "sold" on his personal responsibility to all industry and on his inherent pride of craft, that the advertising campaign might fall flat. Realizing this, the billboard was erected. The board is surrounded by groups of employees at every opportunity.

The interest displayed by the men at this plant has convinced the Dodge people that their idea is fundamentally sound and that if the workman reads the billboard with its "Faithful to All Industry" heading, he must be strongly impressed with the confidence his employer has shown in him and that workman cannot help but have a keener sense of his responsibility to all industry. If workmen get these two points, the Dodge people argue, the billboard has accomplished its purpose. Apparently this has been realized, for the Dodge people are planning to erect other billboards at their various plants and have an implicit belief in their innovation.

The Dodge Mfg. Co. has several plants at Mishawaka, one at Oneida, N. Y., and a Canadian plant and is known as the largest manufacturer of pulleys, hangers, shaftings, couplings, bearings and all other factory transmission devices, and has been in business



for 38 years. The Dodge company has over 50 welfare plans in active and successful operation. Naturally the company has enjoyed a minimum of labor trouble and has almost zero labor turnover. Considering these facts it will be seen that the latest innovation is not a belated scheme or an eleventh hour effort to make a satisfied employee.

The following is the text of the advertisement, reproduced on the billboard:

FAITHFUL TO ALL INDUSTRY

If the long association of men with each other, with their jobs and with their ideals upon which their business is founded, has an improving effect upon the products they build, then another reason for Dodge domination in the power appliance field is reached.

In 1881 a mere handful of men began the Dodge idea of factory service; today, among the thousands of employees, there are still a few of those pioneers; the same executives have had offices since 1893; the "Twenty-five Year Club" has a hundred and more members; and ten- or fifteen-year men are by no means unusual.

The Dodge organization has grown within itself and among its trade by invention, by development, and by the acquisition of other worthy products.

The Dodge ideal has never been out of mind; to build a complete line of products that would cost less to install—that would "go together" right and stay right without supervision or repair through long years of trouble-free service.

To have departed from the manufacture of reliable products for the sake of novelty or innovation, without regard to the fitness of those products for universal factory service, would have been to neglect the underlying principles of our business.

So, in the face of competition which frequently offered "something new" because it was new, Dodge has continued for 38 years, to offer something good because it was reliable.

"Faithful to all industry" is a promise for the future as well as a record of the past.

Hundreds of thousands of industrial plants are involved in that record; millions of dollars' worth of products is daily dependent upon the faithful performance of Dodge equipment.

We want the power user to regard this proven ability for service as a distinct personality—a familiar factor in his plant upon which he can base the production and delivery of the product he builds.

Rest assured that the ideals which have carried Dodge to the present high recognition of factory owners and factory operators will be assiduously maintained.

Know, also, that there are no prejudices in the Dodge organization; any method or product that holds a potential fitness to be included in the Dodge line of power transmission appliances may become a Dodge product; but only when it has proven its reliability upon the Dodge standard of what kind of service it shall render.

Dodge will keep pace with the actual needs of industry, but Dodge men will ever remain true to their creed.

Embodying satisfaction with universal service to industry, "Shorty" starts to work "with the 7 o'clock whistle" all over the country and delivers a full day's work every day. You will find a "Shorty" ready to serve you on the immediate delivery basis in every Dodge branch and in the establishment of every Dodge, Oneida or Keystone dealer. Whenever possible, order Dodge products from your dealer; we prefer it.

*Editor the Dodge Idea, Mishawaka, Ind.

Rockwell Direct Reading Hardness Testing Machine

A portable direct reading machine, known as the Rockwell hardness tester, for hardness tests of steel, brass, copper and some of the harder alloys is being manufactured and marketed by the Wilson-Maeulen Co., 730 East 143rd Street, New York. The principle employed, like that in the Brinell testing machine, is to apply a known load to a ball penetrator and then measure the indentation, but whereas the Brinell machine was designed to measure the diameter of the impression of a $\frac{1}{16}$ -in. ball, which is measured by removing the piece to a microscope, the Rockwell machine is designed to measure the depth of impression of a



The Depth of Impression of a 1/16-In. Ball Is Read Directly on the Index of the Rockwell Hardness Testing Machine.

1/16-in. ball which is done directly on the index of the machine itself. The small ball of the Rockwell machine, it is explained, permits testing wire of smaller diameter than can be tested with large ball penetrators and the light impressing load used permits testing the outer surfaces of even small tubes and those having a wall thickness sometimes as thin as 1/32 in. without putting a mandrel through the tube. Thin sheet stock and such pieces as clock springs can also be tested.

When making the test for hardness on the Rockwell machine, an initial pressure is applied by turning the wheel raising the test piece until an index mark shows that the initial pressure has been applied. This insures that the test piece is held to a firm seating and that the ball breaks through dirt, scale or other superficial matter. The dial of the index is then turned to zero position and the push button at the base of the machine is touched, releasing the major load which is later withdrawn, leaving again only the initial pressure and the dial then shows the depth of impression made by the major load. The indentation, it is explained, is small and hardly noticeable.

The machine weighs approximately 57 lb. and is supplied with several tables to accommodate various shapes of work. Six tests a minute, it is stated, can be made.

Free Licenses to Use the Microcharacter

The microcharacter, the instrument described at length in *THE IRON AGE* of Dec. 30, 1920, for testing the hardness of metal in terms of the actual individual crystals making up the metal, has been patented, but the unusual situation is that the patent, taken out by Christopher H. Bierbaum, vice-president Lumen Bearing Co., Buffalo, and chairman of the bearing metals committee of the American Society of Mechanical Engineers, has been assigned to the society and may be used by manufacturers, who will be licensed without charge.

John A. Topping on the Outlook

Gradual betterment without serious disarrangement to business is how John A. Topping, chairman Republic Iron & Steel Co., regards the 1921 prospects, particularly in iron and steel. In an article in the *Journal of Commerce*, New York, Jan. 3, he discussed the situation in part as follows:

In considering the present prices as compared with pre-war prices it may be confidently stated that existing values as related to costs are as low if not lower than during the pre-war period, and therefore further declines in prices are not probable unless heavier reductions in labor costs are effected than now seems reasonable to expect, because labor reductions will be regulated largely by living costs, which costs, from present levels, will probably recede more slowly in view of recent heavy declines in commodities of all lines of industry.

Furthermore, I believe that commodity values, from the present level, will, as previously stated, recede more slowly and that further adjustments of prices will be influenced to a greater extent than heretofore by credit deflation and will also follow more nearly the general tendency of foreign markets. As to credit deflation this will require time as reductions in public debt can only be effected through governmental economy.

In the meantime the world must live, growth of de-



mand be supplied, at least to the extent of the necessities of life. In this country we are fortunate in having home markets, which consume approximately 90 per cent of our manufactured products, and as this home market is supported by the living requirements of 105,000,000 people, whose purchasing power has not been seriously affected by wage reductions or short crops, I think it is reasonable to assume that average demand is ahead of us, particularly when it is considered that as a result of the war there has been dammed up a demand, as yet unsatisfied, for increased housing capacity and for improved and enlarged transportation facilities, which demand should be released gradually, as money and credit conditions admit of financing such needs.

I believe that the acute stage in our readjustment has been passed and that any further changes or readjustments which may be necessary in time will be brought about gradually and without serious disarrangement to future business.

The Remy electric division of the General Motors Corporation at Anderson, Ind., has been closed until Jan. 17. The manufacturing departments, except the service department, will be closed until Jan. 20, by which time, the officers believe, the automobile business will begin to show improvement.

Readjusting While Fiction of War Prevails

Business Getting Back to Peace Under
Difficulties—Prospects of the New Year
—Development of Merchant Marine

—BY OSWALD F. SCHUETTE—

WASHINGTON, Jan. 6.—Not since American industry met the challenge of war in 1917 has there been a year which promises developments at Washington of such importance to industry as the coming twelve months. For that reason a survey of the prospects for 1921 is more important than a retrospect of 1920. The year just passed was marked by slow and inadequate attempts on the part of the Government and of the country to find a basis of industrial readjustment. The primary difficulty lay in the fact that the business of making peace was left entirely to industry and commerce, while official Washington maintained the fiction of a state of war. This handicap proved a vital hindrance to the readjustment of America's enormous foreign business, and hampered seriously the efforts of industry to accommodate itself to the inevitable deflation at home.

The iron and steel industry felt this particularly and will feel it even more vitally in the readjustment which will come in 1921. The relations of the Government to industrial enterprises have always been vital to the steel industry because of the magnitude of the latter's operations, and because of its ramifications throughout the other industries of the nation.

At the head of the list of prospective Government developments in 1921 stands the problem of the revision of the federal taxation laws. Here again the steel industry will find a vital interest because the heavy demands of the industry make necessary the employment of highly capitalized corporations which promise to be the chief subjects or objects of federal tax interests. As I have pointed out in the Washington despatches to THE IRON AGE, tax revision will deal largely with readjustment of the Government tax upon corporations. Chiefly, this is expected to center in the repeal of the excess profits tax and a corresponding increase in the direct corporation tax, either in a higher rate of normal tax on profits or a tax upon undistributed earnings, and probably both.

Revision of the Tariff

Coupled with this, and to be handled by the same Congressional committees, will come a thorough revision of the tariff. This time the revision promises to be a revision upward. Whether the steel schedules will be increased correspondingly is still a matter of much doubt. The exports of iron and steel in every form, from ore to the highest point of fabrication, are so far in excess of the imports that general increases in the iron and steel tariffs seem unlikely. Should Congress accept the present proposals for a protective tariff on manganese, chrome, molybdenum, tungsten, and other alloy metals, it is likely, of course, that a corresponding increase will be placed upon importations of high-speed steels and of other alloy-steel products.

Disposal of Surplus Stocks by the Government

THE disposal of the Government's surplus stocks of steel and other items still on hand as the result of the war caused far more trouble to the Government in 1920 than to the industries involved. None of the surplus left proved sufficient seriously to affect prices. The disposal of machine tools which had worried machine tool manufacturers at the beginning of 1920 progressed slowly. A variety of methods were tried, but the plan of issuing a catalog of all the Government's surplus machine tools was given up early in the year. It was finally decided to sell all these tools by advertising bulletins issued from a number of district headquarters. As a result, all of the tools that could be used for gen-

eral work and which had been listed as surplus at the beginning of the year were disposed of during 1920. Something like \$500,000 worth of general purpose machine tools has been declared surplus within the past four months and is now awaiting sale at Port Newark, Picatinny Arsenal, Rochester, and Philadelphia. There are still several million dollars' worth—based on original cost—of special machine tools such as gun-boring tools, for which the Government has not been able to find a market and which, therefore, are being sold on a tonnage basis. To November, 1920, the War Department had disposed of machine tools costing \$27,001,532 for \$11,901,257, a recovery value of 44 per cent. Be-

But the questions of taxation and tariff are expected to monopolize the special attention of the Sixty-seventh Congress, which will sit throughout the spring and summer and probably all of the autumn of 1921. Other problems of Government readjustment will be relegated, as far as possible, to the regular session which will convene in December, 1921.

The fundamental problem of restoring peace will doubtless be dealt with by the new Administration immediately upon its assumption of power in March. So far as Congressional co-operation is necessary in this task, it probably will be forthcoming. But the task of readjusting the Government's relations to American industry will probably be left to the December session. There has been a decided reaction against Government interference in industry made necessary by the war. During the past year, much of this has been carried on under unrepealed war powers. The new Congress is expected to make short work of these assumptions of authority. The new Administration will come into power under pledges of "More business in Government and less Government in business." It will not be possible, however, to forecast the extent to which this will be applied until President Harding is in the White House and the new executive programs are more definitely outlined. Only a part of the Government's attitude toward industry can be interpreted from the laws that are on the statute books. It is their execution and administration, chiefly through the Department of Justice, but also by the Interstate Commerce Commission, the Federal Trade Commission and other agencies, that determine the final extent of federal control of commerce and of industry. The reaction against this federal control was emphasized during the past year by the revelations of the mismanagement of the United States Shipping Board.

It figured also in the return of the railroads to private control.

There is another problem in which Governmental interest is being reawakened by the crisis through which industry is passing. This is the employment problem. During the war the Government took hold of the situation because of the scarcity of labor. Its chief interest at that time was directed to a distribution of workers in the war industries. When the war was over and the occasion for this interest ceased and despite the efforts of the United States Employment Service to maintain its organization at Uncle Sam's expense, Congress refused an appropriation.

Now the Government's attention is being redirected to this problem, not by the scarcity of labor but by the scarcity of jobs. The growth of unemployment is becoming more serious and new efforts are being made to revive the employment service which, since the cessation of direct appropriations, has been maintained in skeleton form by the Department of Labor.

sides this, it obtained \$2,343,165 for tools whose original cost to the Government it has not been able to ascertain. Machinery and engineering equipment costing \$18,091,800 were sold for \$9,207,480; while \$716,792 was obtained by the sale of similar equipment whose original purchase price is not of record. A little more

than \$30,000,000 was realized from the sale of ferrous metals, including scrap. Of this \$19,306,000 represents the proceeds of property costing \$85,212,881—a recovery percentage of 23—while \$10,689,460 represents the sale of property whose original cost is recorded as unknown.

Government and Its Relations to the Railroads

THE steel industry had a vital interest in the Government's relations to the railroads of the country during 1920. Under executive order the roads were turned back to their owners by President Wilson on March 1, after being controlled by the Government during the greater part of the war. On the same date, the new transportation act became effective. Under this act, the railroads were guaranteed the standard return for a period of six months thereafter. This guaranty has cost the Government about \$650,000,000.

Immediately following the return of the roads, the railroads requested increased freight and passenger rates under the provision of the transportation act, which provided that the Interstate Commerce Commission should adjust rates so as to yield an average return of 5½ per cent on the value of the property invested by groups of roads. The railroads urged that the return be made 6 per cent, the additional one-half per cent being permitted under the act as a means of providing for additions and betterments. The commission held that the roads should have the full 6 per cent as a means of making possible their rehabilitation, and in August announced increases in rates ranging from 20 to 40 per cent. The increased rates became effective, so far as interstate rates were concerned, a few days in advance of Sept. 1, when the Government guaranty expired. The earnings of the railroads since Sept. 1 have been disappointing, the increase failing to bring the total up to the average of 6 per cent. However, the railroads have no intention of asking for further increases until the present rates have had a thorough try-out.

The Regulation of Rates

One of the significant railroad developments of the year has concerned intrastate rates. Under decisions recently rendered, the Interstate Commerce Commission assumed jurisdiction in States where State commissions have refused to increase the intrastate rates to the level of the new interstate rates. The commission has ordered increases in intrastate rates under broader authority given in the transportation act to adjust intrastate rates where they may be discriminatory as relating to interstate commerce. The State commissions have resisted this action on the ground that it destroyed their rate-making authority and propose to fight the matter through to the Supreme Court of the United States.

Railroad officials claim important developments toward increased efficiency of the roads since their return to private control. It is shown that the average movement per freight car per day has increased from 22.3 to 28.6 miles, and the average load per car has increased from 28.3 to 30 tons. Traffic during the year has been the heaviest in the history of the country. Freight loaded has several times exceeded 1,000,000 cars per week, which was the record established during the most active period of the war.

The transportation act gave the Interstate Commerce Commission broader powers in several respects, among them being authority to issue priority orders to control traffic and authority over the issuance of securities. Under its new powers the Interstate Commerce Commission took steps to clear up the freight congestion which followed strikes of switchmen and other railroad employees, and also issued a number of orders designed to insure the movement of coal during the summer months in order to avoid a shortage in the present winter. As a result of these priority orders, needs of New England and the Northwest as well as other parts of the country appear to have been taken care of adequately. The priority orders resulted in considerable difficulty for the steel and building material industries early in the summer, the open top cars

needed for the movement of steel products being diverted for the transportation of coal.

Merchant Marine

The year 1920 has also been an important one in the development of the American merchant marine, a development vitally affecting the iron and steel industry of the United States. The new shipping act was enacted in June. This measure contained various features designed to aid in building up American shipping. There has been considerable delay in making its provisions operative, the President having made no appointments of members of the enlarged Shipping Board until November. With the tenure of office of the seven members of the board uncertain as a result of the probable refusal of the Senate to confirm the appointments, it has not been possible for them to accomplish much up to date.

One of the important provisions of the shipping act, the section that provides that preferential export rail rates shall not apply except on commodities to be carried in American vessels, has not become effective because of a showing that sufficient American ships are not yet available to handle the Pacific traffic. Enforcement of this section has been suspended indefinitely by the Interstate Commerce Commission at the request of the Shipping Board.

Another important section of the shipping act directed the President to abrogate commercial treaties with other nations which prevent the imposition of discriminating duties or tonnage taxes. President Wilson has refused to carry out this mandate and in consequence no step has been taken to make this provision effective.

Operation of merchant ships owned by the Shipping Board developed numerous difficulties during the year. One of the developments of the year was the adoption of a new form of agency contract between the Shipping Board and ship operators under which the operators are allowed 5 per cent of the gross receipts from exports and 2.5 per cent of the gross receipts from imports. This scheme is not entirely satisfactory, and there is a good deal of agitation for a bare boat charter arrangement.

Costs of Production

Early in the year, the Federal Trade Commission undertook to obtain monthly reports from steel, coke and coal producers relative to costs of production. The coal producers objected first and obtained temporary injunction restraining the commission from requiring these monthly reports. Steel producers then showed a similar disinclination to furnish the detailed reports requested. The commission brought proceedings against two steel companies which had failed to furnish the reports. These proceedings were not pushed after 20 steel companies had brought mandamus proceedings in the District of Columbia against the commission. A temporary restraining order was issued against the commission on which further proceedings will take place in the near future in order to obtain a final determination of the issues involved by the Supreme Court of the United States.

Curtailment of Credits

Foreign and domestic credits are so important to the steel industry that it has watched with particular interest the readjustment efforts of the Federal Reserve System. In May the Federal Reserve Board held a conference with the members of the advisory council and Class A directors of the system at which the word went out to bring about a rigid curtailment of credit for non-essentials. The board did not attempt to define essential industry but left it to the banks to say what classes should be afforded credit. This

action had a pronounced effect. Speculative loans were reduced in the New York district and there was a tightening up all along the line. The policy affected the automobile industry, the banks refusing to continue liberal credit arrangements under which automobiles have been purchased by many in the past.

So far as total loans have been concerned, there has been no contraction during the year but, instead, an expansion. While the curtailment of credit has applied to various industries, it has been the intention of the Federal Reserve Board that liberal credit should be extended to essential industries. The offi-

cials of the board have attempted vainly to prove that they did not intend any contraction of credit for agricultural purposes. Agriculture has been up in arms because sufficient credit has not been available to enable the producers to hold their crops until better prices could be obtained. The falling prices have hit agriculture harder than some other industries. The credit problem, however, has affected all classes of industry and the solution is not yet in sight. To the credit of the Federal Reserve system, it is claimed that the needs of the situation have been met much better than possibly could have been done under the former system.

Vicissitudes of Exporting in 1920

What Has Been the Result of Labor Troubles Here, Financial Troubles Abroad and Adverse Exchange Movements

GREAT BRITAIN with large orders for merchant ships from domestic and foreign sources, purchased heavily in 1920 of ship plates and tank plates, angles and bars, to the extent of about 142,488 gross tons of ship plates in the first nine months of the year. Japan, however, was the heaviest purchaser of this material, showing a total of ship and tank plates for the first nine months of 209,473 gross tons, of which 87,807 gross tons, or about 62 per cent, was shipped in the first quarter of the year, when Japanese buying was the heaviest.

Japanese shipyards despite the present depression are still showing intense activity, not only in shipbuilding materials but in cranes, machine tools and other equipment. The Imperial government stands behind the shipbuilders, evidenced by a proposed tariff law increasing the duty on iron and steel, but providing that shipyards unable to obtain sufficient material from domestic sources shall be reimbursed to the extent of the duty paid on imports.

First Serious Setback to Exporting

The first serious curtailment to export trade occurred about April 1, when, following the withdrawal of financial support by the Japanese government, the Yokohama Savings Bank failed, carrying with it several reputable institutions. This was followed by numerous financial difficulties of other banks and exporters, who without financial backing were unable to carry the heavy tonnages, in many instances speculative, that had been purchased in answer to the frenzied demand for material immediately following the war. Much of this material was purchased c.i.f. Japanese port and in most cases cancellation was practically impossible. Added to their other difficulties the Japanese faced a merchants boycott by the Chinese.

Shipments of old orders continued and Yokohama, Osaka and other ports became appallingly congested with warehouses filled, piers overflowing and all available space occupied. These shipments continued until August, when the greater part of the back tonnages had been delivered. September shipments were small, 28,616 gross tons, or about 45 per cent less than August, which was smaller than the preceding months. Forced to dispose of stocks in order to obtain cash, dealers in Japan reduced quotations until toward the end of June prices reached what was believed to be the lowest level. During July and early in August there was a slight recovery but about Aug. 15, a new decline set in and on Dec. 1, prices of most materials had reached a new low level, with pig iron of Japanese origin, which had steadily fluctuated during the period of depression between yen 90 and yen 95, quoted at yen 85 with few transactions. Japanese exporters and others in close touch with Japanese affairs predict but little improvement of Japan as an importer of iron and steel during the coming year.

Shift to Dutch East Indies

Following the elimination of Japan as an importer of iron and steel, exporters to Far Eastern markets

found a substitute but on a far smaller scale in the Dutch East Indies and also continued for a time to sell some material to China. But to add to the difficulties of the American exporter, on April 1, about the date of the failure of the Yokohama Savings Bank, the outlaw switchmen's strike was declared and during April, May, June and July the railroad congestion at the ports, particularly New York and later Philadelphia, became so great as to delay shipments for weeks and months. The result was often cancellations and almost always an added expense to exporters in handling cars, paying storage and inability to collect on letters of credit as soon as expected.

Until mid-summer, South American markets, chiefly Argentina and Brazil continued active, but at this time exchange with these countries declined and they could not dispose of their own products at prices more than 15 to 25 per cent of what they had expected to obtain for them. While the Argentine Republic purchased fairly large tonnages of rails during the spring and early summer, shipments of steel rails of all kinds declined to 357 gross tons in September against August shipments of 2882 gross tons. With the exchange rate adverse, large buying ceased and exporters suffered numerous cancellations.

Rise and Fall of German Purchases

Although Germany bought in a small way in the United States, with the mark at from 1c. to 2c., most of her buying was indirect, being financed through other European countries. Early in the spring and until summer, German firms purchased pig iron in small lots, the buying being financed through Holland, which bought machine tools and other manufactures from Germany. Later, when Germany had begun to export to other markets and the exchange value of the mark was approaching 3c., an order was placed with an American export house for several thousand tons of ship plates and shapes for German shipyards and dollar credits were opened in New York. Other large orders of plates were mentioned at this time, but the decline of the mark to a little better than 1c. soon after this transaction prevented further large purchases.

Belgian Buying

Until March of this year, Belgium was a large buyer of soft rerolling billets, pig iron, tin plate and some spiegeleisen, purchasing a total of about 40,000 gross tons of billets during the first ten months of the year, the greater part of which was shipped in the spring. Sales of spiegeleisen continued to be made to Belgian buyers until the price reached \$70 per ton when purchasing practically ceased. Belgian buying continued through the spring until more blast furnaces had been blown in there, more mills had resumed operation and the coal shortage had become less acute through better shipments from Germany on the indemnity and on increased production from Belgian and French mines. Toward the end of May, Belgium not only produced enough material for her own consumption but entered export markets in a small way and by August Belgian

billets were offered in England at a better price than the quotations of American manufacturers.

Early in August the price decline in Belgium, which is still evident began to assume serious proportions and prices of practically all kinds of material have been constantly reduced. These reductions, coupled with the adverse exchange rates have brought Belgian prices far below the American prices for practically all semi-finished and finished products and have aided in shutting the door of European trade to the American exporter.

Conditions of British Trade

During the first quarter of 1920, the United Kingdom purchased heavily of ship plates and semi-finished material in the United States. With the high prices for all iron and steel products prevailing in England, American exporters were able to compete favorably with the British product in both price and quality, despite the exchange and American high prices. As the year advanced and British plants began to resume peace-time production, there was some curtailment of these purchases, which would probably have been greater but for the industrial difficulties through which the British producers passed.

As Belgium increased production and Germany re-entered export trade in the summer, cheaper material began to appear in England, until by September British manufacturers were speaking of the influx of cheap material from the continent as "dumping" and were advocating legislation to prevent it. According to the British Board of Trade, the returns for September show that imports from Belgium in two items alone, wrought iron bars and angles, billets and blooms were 100 per cent greater than in August, while the total of 27,063 gross tons in importations of sheets and plates from continental sources represented an increase of well over 100 per cent of the August figure. Forced by this influx

of low priced material to take some action, Belgian and German billets were selling £7, to £8 under the domestic product and wire products were being sold at less than the production cost in England, and British producers began numerous reductions of price in November.

In September Cuban buyers became involved in financial difficulties, produced by the break of the Cuban sugar market and purchasers of iron, steel and machinery, who were unable to finance their orders, were forced to cancel. In October a moratorium was declared.

As the year drew to a close, numerous exporters began reducing personnel and taking other measures to lower their overhead expenses, and from August on there were a number of failures and liquidations of companies, some of which were organized during the war and others that had been in business for a longer period.

Buying Foreign Material for Export

One large dealer in iron and steel for export and domestic trade offered in the fall tonnages of Belgian material to New York exporters for direct shipment to foreign markets and some material toward the end of the year has been purchased in Belgium by American exporters for shipment to customers in South America and the Dutch East Indies.

While a falling market is one preventive of buying from export markets, the exchange rate is considered by most exporters as the greatest obstacle. In most markets, buyers placing orders in Belgium and Germany or through London do so to their advantage in exchange, while transactions with the United States represent a loss. Argentina finds a loss of more than 21 per cent in dealing with America; Italy faces a loss of more than 82 per cent on the lira; French buyers lose 70 per cent in dollar transactions and the British pound sterling is 27 per cent off. Even Sweden must consider a loss of 30 per cent in American purchases and buyers in the Dutch East Indies pay 45 per cent more than normal.

Lead and Zinc in 1920

The mine output of lead and zinc and the refinery output of lead in the United States increased greatly in 1920, after declines in 1919, and the smelter output of zinc was but a little under that of 1919, according to a statement by C. E. Siebenthal, of the U. S. Geological Survey, compiled from reports and estimates by producers and others.

The production of primary domestic desilverized lead in 1920 was about 215,000 net tons, of soft lead about 189,000 tons, and of desilverized soft lead about 70,000 tons, making a total output from domestic ores of about 474,000 tons of refined lead, compared with 424,433 tons in 1919, made up of 208,751 tons of desilverized lead, 147,744 tons of soft lead, and 67,938 tons of desilverized soft lead. The output of lead smelted and refined from foreign ore and bullion was about 64,000 tons, compared with 57,787 tons in 1919. The total lead smelted or refined in the United States was thus about 538,000 tons, compared with 482,220 tons in 1919. The production of antimonial lead was nearly 12,000 tons, against 13,874 tons in 1919. The exports of lead of foreign origin were about 22,500 tons and of lead of domestic origin about 3,000 tons, compared with 42,912 tons and 10,510 tons, respectively, in 1919, a decline of nearly 28,000 tons in the total exports. The imports of refined pig lead, which for the years 1916 to 1919 inclusive had been a little over 5000 tons a year, jumped in 1920 to about 34,000 tons. This was a result of the relations of the New York and London prices and the rate of exchange, which not only made it profitable to reimport domestic lead into the United States (which came in duty-free) but also to import foreign pig lead. Up to the end of November 9425 tons of refined lead had come in from Mexico, 1680 tons from France, and 12,978 tons from England. Some transshipped Spanish and Australian lead is included in these quantities.

The production of primary metallic zinc from domestic ores in 1920 was about 449,000 tons and from foreign ores about 14,000 tons, a total of 463,000 tons, compared with 452,272, 13,471 and 465,743 tons, re-

spectively, in 1919. Of the output of domestic zinc in 1920 about 51,000 tons consisted of electrolytic zinc, as compared with 27,056 tons in 1919. In addition to primary zinc there was an output of about 20,000 tons of redistilled secondary zinc, compared with 19,748 tons in 1919, making a total supply of distilled zinc and electrolytic zinc in 1920 of 483,000 tons, of which 81,000 tons was high grade zinc, 34,000 tons intermediate, 51,000 tons select and brass special, and 317,000 tons prime western. The production of the corresponding grades in 1919 was 45,377, 39,173, 140,917, and 260,024 tons, respectively, a total of 485,491 tons. Of the total output of primary zinc in 1920, about 111,000 tons was made in Illinois, as against 118,340 tons in 1919; 42,000 tons in Kansas, as against 43,942 tons; 110,000 tons in Oklahoma, as against 121,988 tons; 30,000 tons in Arkansas, as against 31,437 tons; and 74,000 tons in Pennsylvania, as against 67,521 tons.

The exports of zinc made from foreign ores were about 28,500 tons and those of zinc made from domestic ores were about 86,000 tons, compared with exports of 16,789 and 129,508 tons respectively in 1919. The exports of domestic zinc included about 12,000 tons of sheet zinc, as against 19,762 tons in 1919. The apparent consumption of primary zinc during 1920 was about 324,000 tons, compared with 323,964 tons in 1919 and 423,792 tons in 1918.

At the end of November 66,700 retorts were reported in operation out of a total of 156,693 retorts, as compared with 95,000 out of 157,456 on June 30, 1920, and with 107,500 out of 157,004 at the end of 1919. Advices late in December put the number of retorts expected to be in operation at the end of the year as about 52,500, or one-third of the total.

The Wellman-Seaver-Morgan Co., Cleveland, has taken an order from the Western Maryland Railway for an improved boat loading plant for loading coal cargoes and bunker coal in all sizes of vessels from small schooners and tugs to 20,000 ton ships. This equipment will be installed in Port Covington, Baltimore, at an expense of over \$250,000, exclusive of the supporting pier.

Chemical Irritants in Cutting Oils

Skin troubles caused by chemical irritants in cutting oils have led to an investigation by the research staff of E. F. Houghton & Co., Philadelphia, who have found that the organically-combined hydrocarbon sulphonates in mineral oils, as well as oils of the paraffin series, are the chief offenders, irritating the skin and allowing bacteria to enter the hair pockets and pores, making pimples and boils.

First the workmen experience small black horny plugs or blackheads, according to the *National Safety News* of Dec. 27, 1920. If unattended, or if contact with the oil continues, these grow in size and give the skin a roughened appearance. Later these impacted pores become inflamed and red blotches appear on the skin. Then the bacteria, which are on the skin under normal conditions or are carried in the polluted oil, enter the inflammations and cause the pimples or boils.

Another factor of irritation are the fine particles of metal which cut the skin. These may be removed from the continuously-used oil by filtration, while the oil may be purified by boiling for an hour at a temperature of 140 deg. Fahr.

Pressed Steel Platforms

The pressed steel platforms shown in an accompanying illustration are one of the products of the recently erected plant of the Powell Pressed Steel Co., Hubbard, Ohio. The pressed steel platforms are formed cold on the large press shown at the right in one illustration. The size of the platforms, it is explained, is limited only by the largest size sheet and plate that the mills can furnish. The corrugations are $\frac{3}{4}$ in. deep and $1\frac{1}{2}$ in. wide, spaced on 6 in. centers. It is pointed out that by having the corrugations as close as 6 in. and $\frac{3}{4}$ in. deep, the strength is materially increased over that provided by a greater center spacing or more shallow depth of the corrugations. Platforms are made in Nos. 7, 9, 10 and 12 gage material, and if special racks or bins are required they can be attached to the platforms.

The usual capacity for handling pressed steel stampings is provided by the two presses shown, as they will handle material up to 13 ft. 6 in. in length

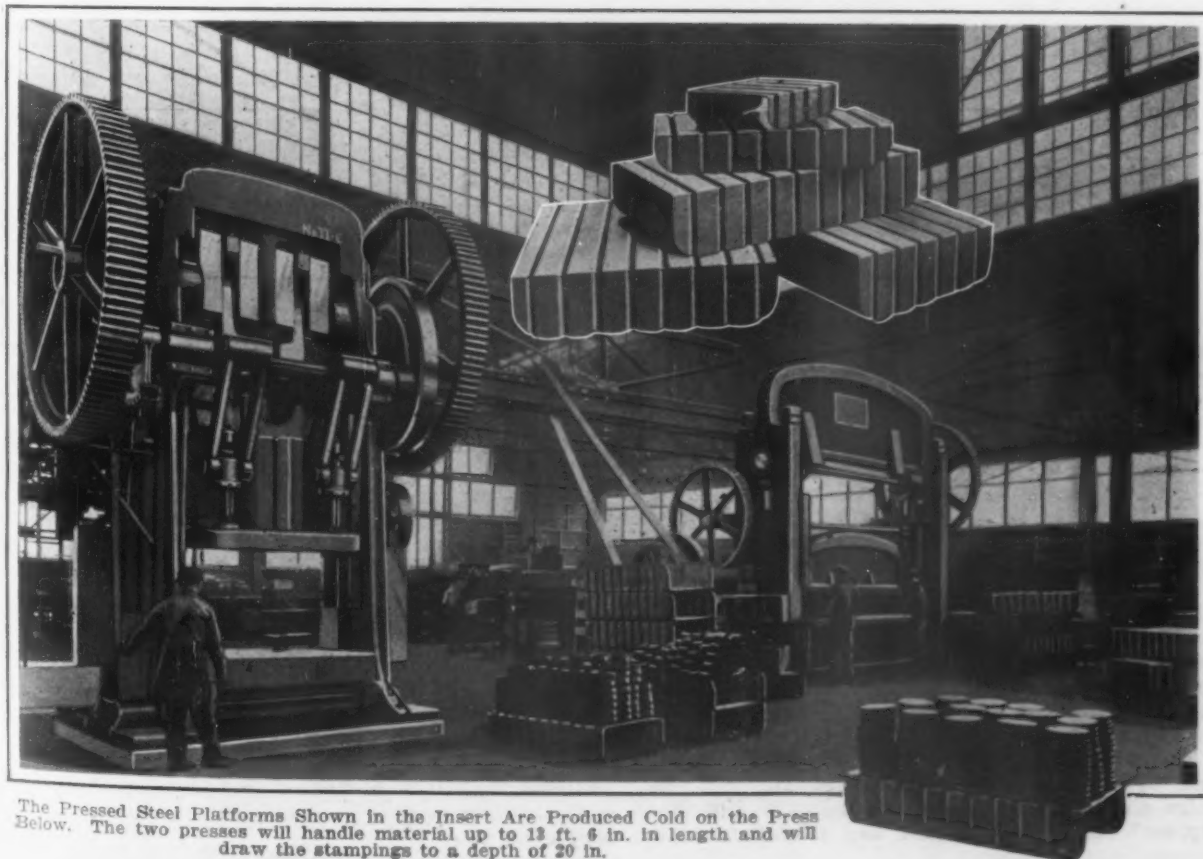
and will draw the stampings to a depth of 20 in. Stampings for automobiles, agricultural machinery and special stampings of various kinds are also manufactured.

Daniel M. Luehrs Co. Organized

The Daniel M. Luehrs Co., Cleveland, was recently organized to engage in industrial engineering and has established offices and laboratories at 2015 East 65th Street. Daniel Luehrs, who is president of the company, was formerly with the McCreary Engineering Co., Toledo, later with the American Blower Co., Detroit, and served in the ordnance department during the war. The company's laboratories will be in charge of C. A. Breed, metallurgist, who was connected with the General Electric Co. for 10 years, and E. M. Huemann, chemist, who has been connected with the chemical laboratories of various industrial companies. H. W. Hough, formerly chief electrical engineer with the Cleveland Electric Illuminating Co., and having wide experience in power plant design, will handle the company's electrical work. Another member of the organization is S. J. Brady, who has had experience with various companies in the design and operation of electric furnaces. The Luehrs company will design industrial plants, lay out and install equipment, engage in research work and design special machinery.

The Stewart Iron Co., Ltd., Sharon, Pa., has been reorganized as an Ohio corporation under the name of the Stewart Furnace Co., and the new company has taken over the business and property of the old interest, which operated for years as a Pennsylvania co-partnership association. There is no change, however, in the ownership. Harvey H. Brown is president of the company; Fayette Brown, vice-president; Samuel McClure, second vice-president and general manager and George Nichols, secretary and treasurer.

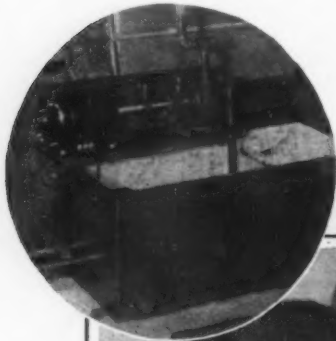
The Pattern Manufacturers' Association of Indianapolis has been organized, with no capital stock, to promote the welfare of the pattern manufacturing business. The directors are Peter Lambertus, W. J. Callahan, I. W. Smith, M. C. Greuling, T. E. Miller, C. J. Gisler and Jos. Emminger, Jr.



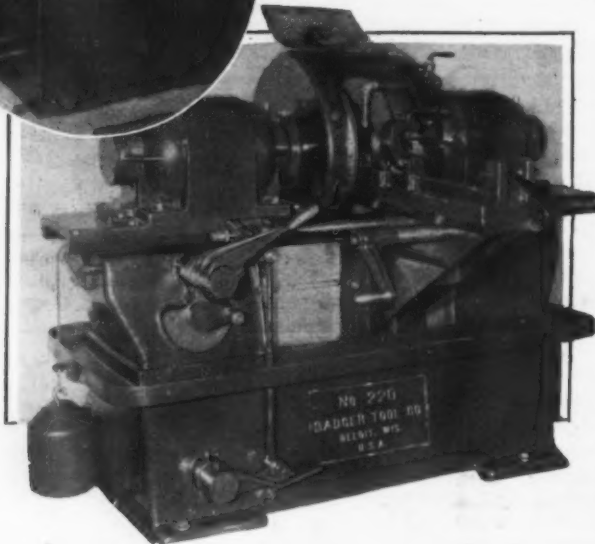
The Pressed Steel Platforms Shown in the Insert Are Produced Cold on the Press Below. The two presses will handle material up to 13 ft. 6 in. in length and will draw the stampings to a depth of 20 in.

Machine for Grinding Eyes of Leaf Springs

A new No. 220 motor driven grinder especially equipped for grinding the eyes of leaf springs is announced by the Badger Tool Co., Beloit, Wis. The purpose is to grind each eye down to required length to fit the spring shackle. The spring grinding attachment consists of a support carrying a sliding ram which is caused to move in and out between the grinding wheels by rack and pinion driven by the crank shown in the accompanying illustration. The eye of the spring rests in a hardened V-block attached to the rear end of the ram and adjustable upright lugs locate the spring so that the ends of the eye are ground parallel to the general axis of the entire spring. A quick acting clamp



Double Spindle Badger Grinder Equipped for Grinding the Eyes of Leaf Springs. Each spindle is driven by a 5-hp. motor and a 1/2-hp. motor drives the water pump



screw locks this spring in position. A sheet metal pan incloses this spring grinding attachment, which together with the wheel hoods and drip pans, completely surround the machine base and confine the grinding compound and return it to the tank attached to the rear of the machine.

This is a complete motor driven unit, each spindle being equipped with special fully inclosed 5-hp. motors and a 1/2-hp. motor drives the water pump. Machine motors are of special construction and fitted with both radial and thrust ball bearings. The 16-in. diameter cylinder wheels are mounted in Badger cylinder wheel chucks. In operation the spring is clamped in position, the two grinding wheels brought up to a stop and the spring passed back and forth between the grinding wheels.

The machine is of double spindle type and is made of many classes of parallel surface grinding in both belt and motor drive and equipped for both wet or dry grinding.

Steel Casting Plants and Iron Foundries

The Best Steel Casting Co., Oakland, Cal., during 1920 built an up-to-date iron foundry with a capacity of about 800 tons of iron castings per month. It is equipped with three cupolas and one 10-ton and one 5-ton traveling crane and five small ones with two 1-ton cranes in addition to five core ovens and two drying ovens. This new foundry is housed in a building about 360 ft. long by 40 ft. wide, and bays on each side of about 30 ft. each, making a total width of about 100 ft.

Isaac G. Johnson & Co., Spuyten Duyvil, New York City, in 1921 will install one 3-ton electric furnace, the estimated annual capacity of which in steel castings is

7200 net tons. This equipment takes the place of two side blow convertors, removed, which had a capacity of 4500 tons per year. This change indicates a net gain in capacity of steel castings of 2700 tons per year.

The Adamson Machine Co., Akron, Ohio, last year enlarged its open-hearth furnace. This previously had a capacity of 10 tons and it has been rebuilt so that the output will be 15 tons per heat, thus increasing the open-hearth capacity of the plant 50 per cent. This furnace will be started early this year.

The Lundin Steel Castings Co., Neponset, Mass., last year installed a new 5-ton open-hearth furnace double the capacity of the one used in 1919, which it replaces.

The National Steel Foundries, Milwaukee, Wis., producers of open-hearth, semi-steel and gray iron castings, is building an addition to its steel foundry 180 by 166 ft., in which are being installed two new 20-ton open-hearth furnaces. This will increase the capacity of the company to approximately 12,000 tons of finished castings per year. It is expected that the new capacity will be in operation early in February.

The Buckeye Steel Castings Co., Columbus, Ohio, is adding one 6-ton electric furnace to its present capacity.

The Superior Steel Casting Co., Benton Harbor, Mich., last year added a new malleable casting unit with a capacity of 9000 tons per year.

The Baltimore Malleable Iron & Steel Casting Co., Baltimore, Md., last year installed two new annealing furnaces and one 25-ton melting furnace and contemplates erecting three additional annealing and one additional melting furnace this year, all for producing malleable iron.

To Organize New York Section of Industrial Cost Association

A meeting will be held in New York at the rooms of the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, on the evening of Jan. 20, at 8 o'clock, to organize a New York section of the Industrial Cost Association.

A number of the national officers and directors of the association will be present and tell of this movement which has been inaugurated for the general welfare of American industry, and how the individual manufacturer can be benefited by membership in the association. In addition, a prominent speaker is expected to impress upon the manufacturers present the importance of cost control.

A. A. Alles, Jr., secretary-treasurer of the association, Peoples Bank Building, Pittsburgh, says the association is accumulating a lot of valuable information which is to be placed at the disposal of members and local sections. It is quite generally recognized, he emphasizes, that there is a great difference between cost accounting for accounting purposes and the standardization and development of costs for the purpose of industrial control. For that reason, the association is not concerned in any way with organizations promoted by professional accountants and operated entirely for accounting and professional purposes. The Industrial Cost Association is an organization of executives of manufacturing concerns and manufacturing associations who are interested in cost from a manufacturing point of view.

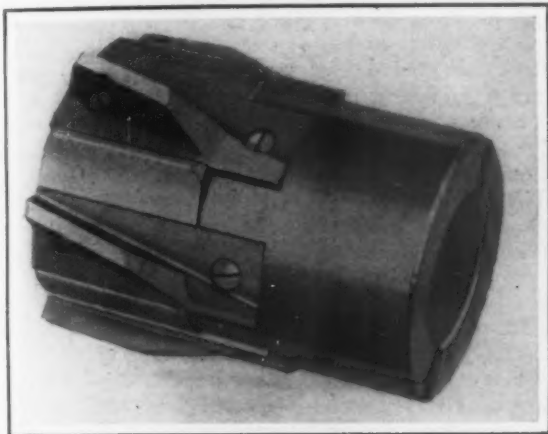
Cost short-cuts of member companies will be made available to members, but the association plans to go further than this and explain why certain things are done. The association's plans comprehend developing principles and policies which have a universal application entirely independent of the mechanism through which they are applied.

Those interested in the meeting are invited to communicate with the chairman of the New York organization committee, F. W. Kennedy, *Electric Review*, 1736 Park Row Building, New York, or with Mr. Alles.

The Jenkins Brothers Co., Bridgeport, Conn., manufacturer of valves, distributed a Christmas bonus to employees on a basis of 10 per cent of their earnings for the year. About 750 operatives are engaged at the plant, the distribution totaling about \$100,000.

Manufacturing Reamer

A manufacturing reamer made in three body types—shell reamer, straight shank machine reamer and taper shank machine reamer—is announced by the Gisholt Machine Co., Madison, Wis. In these body types any of the following blades are interchangeable: right-hand spiral for fast reaming in steel; left-hand spiral for fine finish in steel, aluminum and bronze; and straight blades for cast iron work. This assortment of body types and blades is emphasized as meeting all requirements of machine reaming. The reamer, it is explained, is especially suited for reaming large quantities of duplicate work and will stand without



Reamer Made in Three Body Types and with Interchangeable Blades for Various Requirements of Machine Reaming. Especially for Duplicate Work in Large Quantities

injury to itself, much heavier feeds than those usually employed in reaming. It can be readily adjusted in the tool room but is so constructed that the machine operator is not likely to attempt adjustment, thus reducing the chances of holes being reamed inaccurately.

As shown in the accompanying illustration, the reamer body is milled with a suitable number of blade seats which are wide and comparatively shallow. The blades are high speed steel ground on the sides and bottoms so that they not only fit snugly in the blade seats, but are interchangeable. The blades are supported against end thrust by the reamer body itself. The screws shown only retain the blade in the slot and do not take any appreciable strain of the cut. When worn below size the blades can be packed up with tin foil underlay stock which is furnished. This adjustment may be repeated several times, and when the blades are finally worn out they may be replaced with new ones.

Credit Men Propose Tax Reforms

The committee on Federal taxation of the National Association of Credit Men has published a book entitled, "The Undistributed Earnings Tax—a plan to tax the current year's earnings of corporations not distributed." This tax is being considered by Congress to take the place of the excess profits tax. Copies of the book have been sent to all members of Congress and to thousands of business men. Among the recommendations of the committee are, elimination of the excess profits tax; elimination of the corporation income tax; dividends from current earnings to be subject to the normal tax in the hands of the individual; substitution of a corporation undistributed earnings tax at graduated rates; dividends which are paid from earnings of prior years on which the corporation has paid the undistributed earnings tax, not to be considered as income to the individual shareholder; dividends may not be paid from surplus until earnings of current year have first been used for that purpose; adjustment of rates of taxation on personal incomes (both normal and surtax) to meet the requirements from income taxes.

The Carpenter Steel Co., Reading, Pa., has closed practically all departments at its plant, affecting about 2000 men.

Violation of Anti-Trust Laws Charged

The Alexander Milburn Co., Baltimore, has filed suit for \$2,250,000 against the Union Carbide & Carbon Corporation of New York and affiliated companies, charging violations of the Sherman and Clayton anti-trust acts and the Federal Trade Commission act. The suit was filed last week in the United States District Court, Baltimore. The other firms named in the suit, which represents threefold damages, are the Union Carbide Co., the Union Carbide Sales Co., Oxyweld Acetylene Co., Oxyweld Railroad Service Co., Linde Air Products Co., Prest-O-Lite Co., Inc., and the Davis-Bournonville Co.

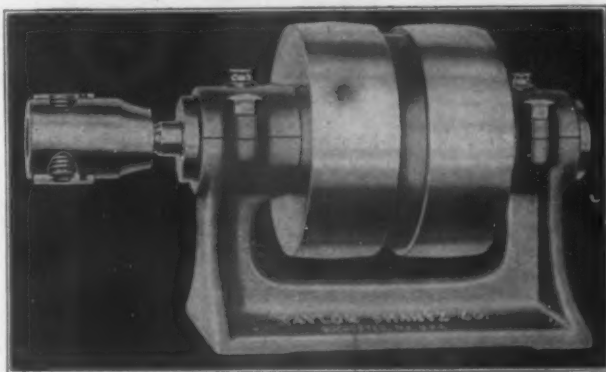
The Baltimore company also filed suit for \$250,000 damages against the Underwriters' Laboratories, Inc., of Chicago, charging failure to make fair, prompt and accurate reports upon certain of the Milburn company's apparatus and also charging discrimination.

In the larger suit it is charged that the defendant entered into unlawful combinations and conspiracies to eliminate competition and monopolize the industry controlling the manufacture and sale of carbide, oxygen gas, acetylene gas, acetylene generators and apparatus used in the welding and cutting industry. It also is charged that interlocking boards of directors had been elected and retained and that the defendant repeatedly published and circulated false reports that the plaintiff would not be able to perform its contracts or properly care for its customers; and made other false representations.

Bench Tapping Machine

A bench tapping machine with a capacity to 5/16 in. has been placed on the market by the Taylor-Shantz Co., 478 St. Paul Street, Rochester, N. Y. The machine taps when pressure is applied to the work and reverses when pulled away. A Jacobs chuck is included in the equipment.

A leather faced friction disk between the pulleys minimizes the danger of broken taps. No countershaft is necessary as the machine can be driven off the line



A Leather Faced Friction Disk Between the Pulleys Minimizes Danger of Broken Taps on New Bench Tapping Machine

shaft with one straight and one crossed belt. The bed is 5 x 7 1/2 in.; the length of spindle and chuck, 12 1/4 in.; the height to top of pulleys, 6 1/2 in., and weight, 21 lb.

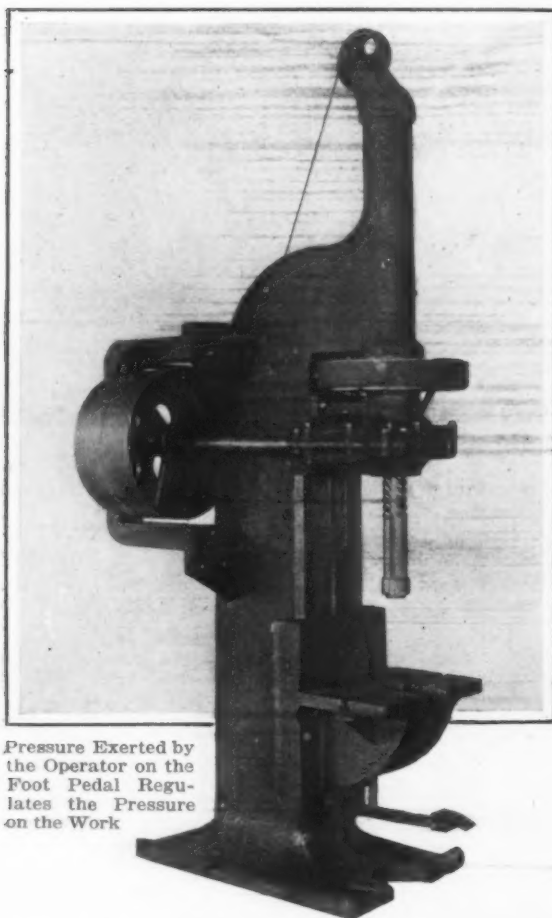
Ball Bearing Centers for Lathes and Grinders

Ball bearing centers designed for lathes and grinders and known as frictionless centers are recent products of the Snellex Mfg. Co., Rochester, N. Y. The ball bearing construction, it is explained, permits the work to be speeded up to obtain maximum production and also makes it possible to produce with a high degree of uniformity work of extreme precision. Other advantages claimed follow: It eliminates friction between work and center, saves center grinding, eliminates chattering of the work, does away with worn or burnt centers and with lubricating between center and work, and also prevents worn or burnt center holes in work, particularly in soft metals.

Power Press with Pressure Range to 20 Tons

A power press, flexible as to the amount of power applied, has been brought out by the General Mfg. Co., Detroit. The pressure exerted upon the work ranges from a few pounds to 20 tons, and is entirely dependent upon and in direct relation to the pressure applied by the operator on the foot pedal. It is pointed out that the flexibility in power equips the press for straightening work and the 18 in. ram stroke and adjustable knee, allowing a maximum distance of 28 in. between the table and the ram, gives a wide range for push broaching, pressing in bushings, assembling gears to shafts, etc.

The machine is of box type construction and is belt



Pressure Exerted by the Operator on the Foot Pedal Regulates the Pressure on the Work

driven. Power is transmitted through a worm gear with a ratio of 10 to 1, running in oil, and two $\frac{3}{4}$ -in. spine keys to the ram, which runs at constant speed in one direction. The ram is threaded and the nut, which is also the brake drum, floats on it. The machine has a band brake of the ordinary type, asbestos lined and anchored on the pull end, the rap end being attached to the foot pedal. Pressure on the foot pedal engages the brake, stopping the nut, and the ram travels down at a speed of from 100 to 140 in. per min., depending on the speed at which the pulley is driven, until the brake band slips or the foot pedal is released. A counterweight inside the box column gives a quick return to the ram, the nut spiraling on the long lead thread, and the end thrust being taken up by ball bearings between the nut and the main casting. The knee adjustment is made by rack and pinion after loosening six nuts on clamp gibs. The knee is held at any desired height by the clamp gibs and a spring plunger which engages a ratchet located at the front of the main casting.

The Henderson-Lawson Corporation, architectural, ornamental iron, bronze and wire, 145 West Thirty-eighth Street, New York, succeeds the Cameron Iron & Bronze Works, Inc., as of Jan. 1.

New Crofoot Gear Works Plant

The Crofoot Gear Works, Inc., formerly located at 31 Ames street, Cambridge, Mass., is now operating at its new plant at Readville, Mass. The new plant is a modern three-story one, 80 x 160 ft., of brick and concrete construction, with steel sashes. It was built originally for the Mason Regulator Co. during the war, but never was occupied by that concern. It is admirably suited for the present owners' purposes and of course possesses the maximum amount of light and ventilation available in the modern factory building.

On the ground floor are located the general and private offices, along the front of the building. A large planning and engineering department extends along the entire length of one side of the plant. The rest of the ground floor is occupied by the automatic machine and shipping departments, and store room. The automatic department covers an area of 60 x 120 ft. and contains 20 Gridley and Cleveland machines of various capacities for working up bar stock and gear blanks.

The major portion of the second floor, which is 80 x 160 ft., is devoted to gear production equipment. There are installed here approximately 130 machine tools, including a battery of fifteen hand cutters of Crofoot Gear Works design, which are used almost exclusively for small, fine, accurate work.

Careful inspection plays an important part in the product. Every gear is inspected between each main machine operation, and inspected and tested before the trade mark of the company and the date of production are stamped thereon. Other tests also are made as to the physical properties of case hardened work. The company makes most of the special small tools required in its production work, and one corner of this second floor is given over to their manufacture.

The third floor of the plant, at present, is used largely for storage purposes, but it is the intention of the company, in the near future, to install additional equipment there.

Electric power is furnished by the Edison Electric Illuminating Co. of Boston. There is a boiler room containing a modern steam heating system, including the Mason Regulator Co.'s appliances, and a hot water system for use in the summer. The comfort and convenience of the employees are provided for in large sanitary clothes rooms, washrooms and toilets.

The plant is situated on a plot of land sufficiently large to permit any extension which the management may deem necessary for several years to come.

This company is notable for its capacity for making medium and small gears to customers' specifications. It specializes in work up to 12-in. in diameter. Small gears are made for automobile manufacturers, and other customers include manufacturers of textile machinery, electrical machinery, machine tools and domestic appliances. Its product includes fiber as well as metal gears.

Starting in 1911 as a small individual business, employing less than 25 men, the company incorporated three years later and moved to Ames Street, Cambridge, where it remained in rented quarters until it moved to its Readville plant. The company employment list today numbers about 200 machinists and helpers.

Charles E. Crofoot is president and general manager; E. R. Lyman is assistant general manager; H. C. Woodsum is head of the planning department; and Joseph Cavicchi is works engineer. Mr. Crofoot's experience in gear making extends over a period of twenty years, the early part of which was with the Boston Gear Works.

The Chamber of Commerce of the United States has decided to hold its annual convention at Atlantic City, April 27, 28, and 29. Members of the new cabinet of President-elect Harding will be among the prominent speakers. The subject of revision of the tax laws will be one of the most important of those discussed.

LABOR UNION CHARGES

Investigation Ordered by Interstate Commerce Commission of Alleged Closing of Shops

WASHINGTON, Jan. 11.—The Interstate Commerce Commission has ordered an investigation of the charges by railroad labor leaders that repair work of the railroads is costing excessive amounts. A formal order of the commission provides for an inquiry into charges "that common carriers by railroad subject to the Interstate Commerce Act have caused and are causing certain of their locomotives and other equipment to be constructed and repaired at construction or repair shops other than their own, and have purchased and are purchasing from or through such shops material and supplies used in such construction and repair, at costs in excess of those for similar construction and repairs in their own shops, including material and supplies therefor, in disregard of efficient and economical arrangement, resulting in unreasonable expenditures, and otherwise contrary to law."

The charges have been made by William H. Johnston, president of the International Association of Machinists. Mr. Johnston charges that the big railroads, especially those affiliated in a financial way with J. P. Morgan & Co., are closing their repair shops, throwing thousands of union men out of work, and are giving locomotive and freight car repair work at exorbitant rates to companies in which railroad corporations or banking groups are interested. He declares that more than 30,000 union men already have lost their jobs in this manner.

The Senate committee on interstate commerce has held hearings during the past week on the Frelinghuysen bill which is designed as a substitute for Section 10 of the Clayton anti-trust act relating to transactions between railroad companies, their subsidiaries and material and supply companies. Consideration of the Frelinghuysen bill followed President Wilson's veto of the bill extending for one year more the date upon which the provisions of Section 10 become effective.

Prompt Denial Made

Elbert H. Gary, chairman United States Steel Corporation, stated Monday that there was no justification, so far as his company was concerned, for charges contained in the petition of the International Association of Machinists. Railroad officials also denied the charges and the railroads are preparing to show that they are not true. The law committee of the Association of Railway Executives has the matter under consideration.

Unemployment Insurance Funds

When any industrial depression, involving shutdowns and curtailment of production through practically all basic industries, results in lay-offs and a labor surplus, many workers dismissed, either temporarily or permanently, become suspicious of the attitude of management, believing intention rather than necessity is the cause of their unemployment.

Management, on the other hand, in order to preserve existence in facing world-wide economic causes, may have to force shutdowns through no will or desire of its own.

The employer's relation to unemployment is not yet fully determined. The notion that he has any direct responsibility for unemployment which requires serious consideration on his part is still novel, but it is interesting to note efforts on the part of two companies in meeting the unemployment problem by means of both prevention and relief. Deering, Milliken & Co., maintaining plants in New York State at Wappingers Falls and West Haverstraw, have maintained a partnership plan through the establishment of an unemployment insurance fund. A sinking fund out of which unemployment insurance is paid is maintained by setting aside 15 per cent of the earnings over and above capital's

wage of 6 per cent and current wages to labor. While the plan has been in operation only a comparatively brief period, it has thus far worked successfully, particularly in meeting the strain of present industrial conditions.

"Conditions this year," says one of the heads of this company, "are furnishing quite a test of the unemployment guarantee feature of our partnership plan. But as the following figures show, it is standing the unusual strain, and actually preventing much distress. During the past year, there has been distributed from the unemployment insurance fund at one plant, \$39,343.93 or 3½ per cent of the total annual payroll. At another plant, the sinking fund against unemployment has this year made payments of \$14,789.53, or 3 per cent of the total annual payroll. Unemployment at these plants has been more severe than ever before in our experience. Notwithstanding this fact, the testimony from both representatives of the operatives and managers is unanimously to the effect that the unemployment funds have so far adequately protected the operatives.

"I believe that unemployment insurance is of great value," he continues. "I believe that whoever bears the expense, there will be no cost to the community, as a whole, because our fellow workers and their families must continue to live, whether overburdened by worry and humiliation they be supported by charity or the State, or whether they make ends meet on half pay till re-employment sets in."

The Dennison Mfg. Co., South Framingham, Mass., has also taken vigorous measures for five years toward prevention and relief of unemployment. The management has, first of all, tried to make more regular the highly seasonal character of the industry by various methods, including getting customers to order at least a minimum amount considerably in advance of the season.

Fund Set Aside from Profits

The unemployment fund is set aside by the directors out of profits and accumulated over a period of five years. "It has been established," says a memorandum of the company, "not on a charity, but a business basis, resulting in mutual self-respect; it is not a guarantee of permanent employment or maintenance of regular wage rates." The administration of the fund is through a joint board of two employees from the general works committee and two representatives of the management. The benefits are 80 per cent of wage rate to an employee with dependents, 60 per cent to an employee without dependents. If the employee gains work elsewhere, the rates are 90 per cent and 80 per cent respectively, such amounts as he earns being deducted from the compensation. The regular term of the benefit is six consecutive days, the continuation and rate of continuation after that time being determined by the fund directors.

The memorandum concludes: "In this endeavor this company has kept two fundamental principles constantly in mind. The first is that the highest good is always the prevention, not the relief, of unemployment. The second is that which will do most to prevent relief to having a tendency to pauperize the employees, to check their efforts to safeguard their future, and what will do most to make the giving of relief a stimulus to the employer to prevent unemployment is the proper distribution of the expense of unemployment between employer, employee, and the public."

Wage Reductions Predicted

"When we meet the ideas of the public as to values, I am of the opinion that there is a fair business ahead," states James A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, Ohio. "I fear, however, that it will take two or three months of liquidation to clarify the atmosphere and where we will land at the end of that time no one can determine at present. All of us should assist as far as possible in this readjustment."

Prophesying a wage reduction in the Youngstown district, Mr. Campbell says: "In the last analysis the

public makes the price of steel products and of labor. Reductions in labor are taking place all over the country and the prices of steel products have already been reduced by the independent steel companies from \$7 to \$15 per ton under the prices that ruled six months ago. Our costs, however, have been reduced to some extent by lower prices for fuel and supplies, but on most of our products we cannot more than break even on the present basis."

New Accident Record

With only five lost-time accidents in November and December, all previous records in the safety and welfare department of the Carnegie Steel Co.'s plant at Farrell, Pa., employing 3000 men, were broken. In December, monthly production records were shattered by the billet and blooming mills. The best previous monthly record in the billet mill was established in January, 1920, and the highest previous record for the blooming mill in October, 1916. David Christie is superintendent of rolling and William Kahl is assistant superintendent.

Rents Reduced

The Western Malleable Co., operating three large malleable iron foundries at Beaver Dam, Wis., posted notices Jan. 1, signed by H. L. Kirch, general superintendent, announcing a reduction of 20 per cent in the monthly rentals charged employees for the occupancy of 15 dwellings erected by the company during 1920. The rental rate up to Jan. 1 ranged from \$15 to \$20 per month, depending upon the size of the dwelling.

In the Field of Labor

Compulsory vocational training for those under 21 years of age injured in industry is one of the legislative recommendations contained in the seventh biennial report of the Connecticut Factory Inspection Department.

According to figures just made public by the Massachusetts Public Employment Office, there was a decrease of 52 per cent in the number of requests received from employers for help during December, 1920, as contrasted with the December, 1919, figures, and a decrease of 19 per cent as compared with November, 1920. Applications for employment last month were heavier than they have been before in any December since 1914, averaging 2051 daily.

Effective Jan. 10, wages at the plants of the Excelsior Needle Co., and National Sweeper Co., both of Torrington, Conn., were reduced 20 per cent, and on the same date about 6000 employed at the Winchester Arms Mfg. Co., New Haven, Conn., received a cut in pay.

The wages of miners at the Newport and Anvil mines, Ironwood, Mich., were reduced 15 per cent the first of the year. The mines are operated by the Steel & Tube Co. of America.

Judge D. E. Sullivan of the Superior Court, Chicago, issued an injunction on Jan. 5, restraining 800 machinists from conspiring to interfere with the operations of the plants of the American Car & Foundry Co. in Chicago and Maywood. The machinists of the local plants had gone on a strike in sympathy with machinists at the company's shops in Kansas City and other cities, who are demanding a closed shop.

The Colorado Fuel & Iron Co. will start several of its idle plants on Jan. 16, having reached an agreement with its employees at Pueblo for a reduction of 15 per cent in wages.

Over 20 employees of the Newbern Iron Works & Supply Co., Newbern, N. C., returned to work last week after they had struck because of a 20 per cent reduction in wages. The strike followed the new plan of profit-sharing, the first payments under which showed the same wage reductions as had taken place before the inauguration of the profit-sharing.

When a number of employees refused to accept a

wage reduction in a general revision, the Hubbard Pressed Steel Co. of Niles, Ohio, closed its plant Jan. 8 for an indefinite period.

The Remy Electric Division of the General Motors Corporation, Anderson, Ind., has made a general wage reduction of 20 per cent. The plant shut down early in December. Fewer than 100 of the employees have been called back to work since the New Year, and they exclusively in the service department. Other departments may not resume before February, it is said at the factory. A large order has been booked from the Paige Automobile Co.

The Pawling & Harnischfeger Co., Milwaukee, manufacturer of electric traveling cranes, machine tools, etc., distributed approximately \$60,000 as a bonus payment on Jan. 1 among its employees. The payment was equivalent to two weeks' salary or wages and covered the entire staff and working force.

Indicating the savings propensities of steel workers in the Youngstown district is the fact that the two principal banking institutions opened new savings accounts in 1920 at the rate of 100 a day. The total volume of business transacted in the savings and commercial departments of these two banks totaled over a billion dollars.

Charles M. Schwab on Labor and Business Conditions

Charles M. Schwab, chairman Bethlehem Steel Corporation, speaking before approximately 1200 members of the Massachusetts Bankers' Association and guests at the Copley Plaza, Boston, on the evening of Jan. 5, took an optimistic view of future business in this country and declared that the time is coming when we shall see the wheels of industry humming as they never have hummed before, not under the stress of war production, but under conditions of healthy, normal business. It was the largest number ever attending a gathering by this association, and Mr. Schwab was received enthusiastically. Edmund Platt, vice-governor, federal reserve board, also spoke encouragingly of the future:

Speaking of the system of workmen's representation in force at the Bethlehem plants, for the adjustment of grievances, Mr. Schwab said: "My experience has shown that the intelligent American workman is just as capable of discussing these problems as you are capable of discussing the problems of your business. When the crisis came and a reduction in wages was necessary, they met it without a ripple of discontent. Let the working people be considered the intelligent men that they are."

"If ever a nation was richly endowed to insure a permanence of its position in the years to come, it is the United States. Those who don't believe in the future of the country are the only ones who are going broke. We have done nothing in export lines and will do nothing unless the people at Washington give us ships to carry products to foreign countries. We can dot the oceans with ships, but it takes more than ships to make a merchant marine. Vessels are tied up for lack of work to do and will remain tied up until the people at Washington take steps to make shipping profitable."

Merkel Brothers, Cincinnati, dealers in plumbing and heating supplies, have purchased property on the east side of the C. L. & N. Railroad, south of McMillan Street, and while no definite information has been given out, it is understood the company contemplates the erection of a large warehouse on the site, work on which will probably commence early in the summer.

Property and mineral rights in Marquette County, Mich., valued at \$380,000 have been conveyed to Henry Ford of Detroit. More than 65,800 acres are involved in the transaction and large quantities of iron ore are said to be contained in the land, formerly held by the Michigan Land & Iron Co.

BUYING DRAGS

Further Curtailment of Operations in the Mahoning Valley—Even Pipe Dull

YOUNGSTOWN, OHIO, Jan. 11.—Virtually without exception district iron and steel producers report that buying is at a low ebb, including tubular products, for which there has been a firm demand up to this time. As a result, operations are slowing down with all the independents, though the Steel Corporation interest is maintaining a 90 per cent average rate. In many departments of the Youngstown Sheet & Tube Co., employees are working only half-time; beginning Jan. 10 the sheet mills operate only three days a week. Brier Hill Steel Co. banked the second of its three blast furnaces last week and its finishing departments are practically suspended, though only temporarily. Accessions to operations were made this week by the Trumbull Steel Co. and the Sharon Steel Co. Smaller sheet-mill plants are virtually idle.

Unless there is an improvement in buying, the larger interests expect a further decline in production and an increase in unemployment. It is estimated there are 7000 workers in the Mahoning Valley idle. The Republic Iron & Steel Co. has received an order for 10 miles of pipe for oil development purposes in France, by the Atlantic Gulf Oil Co.

Twenty-eight of the 46 blast furnaces in the Mahoning and Shenango valleys are pouring, of which 18 of the active stacks are in the Mahoning Valley.

Takes Loss of \$5,000,000

In writing its inventory of raw and finished materials down to the basis of current costs, the Youngstown Sheet & Tube Co. has taken a loss of \$5,000,000, officials announce. Similarly drastic action will have to be taken by all lines of business having on hand large stocks of high-priced materials, manufacturers believe, if trade is to be started. Hesitant condition of buying is attributed by James A. Campbell, head of the leading independent interest, to the fact that buyers are not yet certain that prices are firm at current levels. The opinion is gaining ground that a sustained revival may be delayed until the second half and possibly longer.

Readjustment Progressing in New England

The industrial situation in New England is more favorable, although not normal. Several important plants, including the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn., are still closed, but generally speaking more companies are doing business than has been the case before since early in December.

The lowest point in the industrial depression, it is generally believed, came during the last week of 1920, when a very large number of concerns closed their doors for "inventory taking" purposes. At the time such announcements were made to employees, doubt existed in industrial as well as financial circles as to when the plants would reopen and on what working schedule. The number of these concerns added to those that closed prior to Christmas swelled the total to disturbing figures.

Since Jan. 3, however, there has been a fairly complete resumption of plant activity, especially in industries allied with the iron and steel. In several instances, reduction in wages were made upon the reopening of the plants or since then, and a majority of the plants are operating on reduced running schedules. But wage reductions in no instance have been serious, in the most drastic cases not exceeding 20 per cent, so that the average skilled and semi-skilled workman is receiving as much or more money than he did in 1916, and operating schedules have not been reduced to a prohibitive living wage basis.

In a large number of cases plants are operating with reduced forces, but in almost every instance such reductions in the number of employees have been confined to the less efficient labor element and to those

It is pointed out that while stocks of iron and steel products are not large throughout the country, here is a heavy overhanging demand, which should produce a somewhat speedy recovery for the industry when the buying public is convinced that price liquidation has run its course.

About 40 per cent of the open hearth capacity of the Valley is melting this week, as compared with 49 per cent last week, the decline, in face of resumption by Trumbull Steel Co., being due to idleness of Brier Hill company units. Sheet production is at the rate of about 25 per cent. The Sheet & Tube company, Republic Iron & Steel Co. and Trumbull Steel Co. are operating at an average of 50 per cent.

Reductions in price of standard steel pipe by the Sheet & Tube company and the Republic company have failed to stimulate buying, which is falling off. Both companies are quoting all sizes of pipe, including oil country tubular goods, at the Steel Corporation level. These revisions are expected to hasten a wage readjustment, as it is claimed profits from pipe business at the previous price levels enabled the producers to continue existing wages, though some other departments were being operated at a loss.

Sheet Buyers' Market

The buyer is in complete command of the sheet market and is able to secure prompt delivery on less than ton-lot orders. All of the current business is for small tonnages, some orders even calling for three to five bundles. Many such orders are being filled from warehouse stocks. It is the practice to allow such orders to accumulate and regulate rolling schedules accordingly. Absence of buying on the part of the automobile industry is being felt, particularly by some makers of full finished sheets who have catered to the motor car trade to a large extent.

Tin plate business with the leading district maker is in such volume as to enable mills to operate from 50 to 60 per cent during the current quarter, with a fair volume of new business coming in.

In view of the inactivity in the sheet market, the semifinished materials market is marked by dullness. Open-hearth sheet bar makers are still holding out for \$47, though the waiting policy instituted by important buying interests is expected to reduce this price.

who became employees in the respective plants through the circumstances of war. The scaling down of working forces in industries other than those allied with the iron and steel, has been far more drastic, especially in mill and shoe factory towns. Aside from the New York, New Haven & Hartford Railroad Co., the readjustment of labor among the New England railroads so far has been orderly and non-drastring. The New Haven road, however, last week laid off some 2000, chiefly in the mechanical departments, including 200 at the Readville, Mass., car shops, bringing the total layoff since Nov. 10 up to approximately 5000.

Indications are that the readjustment of labor and raw materials in the metal working and allied industries is progressing with less disturbance than anticipated, and it is confidently predicted that business conditions from now on will improve.

Sale of Material Postponed

WASHINGTON, Jan. 11.—The Shipping Board has postponed the sale of surplus material on the Pacific Coast. This material, which it has been estimated is worth as much as \$15,000,000, was recently advertised for sale with bids to be opened on Jan. 14. Previously an arrangement had been made with the Barde Steel Products Co. for the sale of the material but this arrangement was cancelled following criticism of the board's methods before the Walsh investigating committee.

Current production capacity of the Electric Alloy Steel Co., Youngstown, Ohio, whose plant is located at Charleroi, Pa., is 700 tons monthly, which will shortly be increased to 1200 tons by additions nearing completion. The company manufactures high-speed tool steel.

Slight Decrease in Tonnage of Steel Exports

Favorable Showing Under Adverse Exchange Conditions—Heavy Increase Compared with Year Ago—Imports Record Little Change

WASHINGTON, Jan. 6.—Preliminary figures of the iron and steel exports for November, 1920, reveal a decrease in tonnage and a slight increase in valuation as compared with the October, 1920, figures. They mark a heavy increase, however, in both tonnage and valua-

and ferrosilicon, totaled 13,929 tons, worth \$734,440 in November, 1920, against 21,429 tons, worth \$771,304 in November, 1919. For the 11 months period of 1920, these exports totaled 206,773 tons, worth \$9,566,628, against 306,694 tons, worth \$11,756,940 for the first 11 months of 1919. It is interesting to note that while the November, 1919, exports of pig iron to the United Kingdom totaled only 1244 tons, the November, 1920, shipments to that country aggregated 6733 tons. On the other hand, the shipments to Italy, which amounted to 3645 tons in November, 1919, dropped to 844 tons in November, 1920.

Exports of steel rails showed an increase both as against the preceding month and the corresponding month a year ago. They aggregated 67,708 tons in November, 1920, against 54,342 in November, 1919, and 53,266 in October, 1920. Here again there were interesting fluctuations. The lion's share of the 1920 shipments went to Cuba,—16,288 tons, against 6680 in November, 1919. Brazil stood second in the list, with

Exports of Iron and Steel

	Gross Tons		Gross Tons	
	November 1919	November 1920	November 1919	November 1920
Ferromanganese	79	760	2,996	2,903
Ferrosilicon	1	2	4,797	603
All other pig iron	21,349	13,167	298,856	203,267
Scrap	6,289	15,809	23,303	206,395
Bar iron	2,986	4,584	58,769	58,770
Wire rods	8,508	6,141	111,141	104,998
Steel bars	46,687	56,872	481,912	523,953
Billets, ingots and blooms, n.e.s.	13,211	7,042	236,886	213,458
Bolts and nuts	2,223	3,349	37,398	34,606
Hoops and bands	2,810	5,318	47,126	49,034
Horseshoes	163	58	3,222	1,793
Cut nails	160	699	2,839	3,268
Wire nails	4,729	10,023	86,503	81,041
All other nails, including tacks	769	1,580	15,388	10,982
Cast pipes and fittings	4,976	6,819	35,178	55,898
Wrought pipes and fittings	15,152	25,317	324,447	245,133
Radiators and cast-iron house-heating boilers	250	594	4,019	6,827
Railroad spikes	1,046	1,776	23,850	15,190
Steel rails	54,342	67,708	618,300	541,648
Galvanized sheets and plates	8,331	8,137	95,626	97,120
All other sheets and plates	2,136	2,557	38,080	27,297
Steel plates	63,684	79,424	662,253	806,404
Steel sheets	13,147	16,064	169,198	151,513
Ship and tank plates punched and shaped	1,710	5,480	12,903	40,696
Structural iron and steel	22,939	42,839	345,177	430,159
Tin and terne plates	18,935	15,424	189,153	205,456
Barbed wire	8,665	15,508	91,293	115,779
All other wire	11,782	21,246	182,210	167,865
Total	295,045	434,297	4,202,823	4,402,056

tion, over the November, 1919, totals. The November, 1920, import figures show an increase in tonnage but a slight decrease in value as compared with the October, 1920, figures, but an increase of both tonnage and valuation over November, 1919.

Total exports of manufactures of iron and steel in November, 1920, were valued at \$104,827,626, against \$73,930,226 in November, 1919, and \$103,998,528 in October, 1920. For the 11 months ending with Novem-

Exports, January, 1919, to November, 1920

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
January, 1919	360,456	35,793	11,594
February	234,793	20,178	10,407
March	344,506	22,054	8,176
April	408,204	16,300	11,488
May	447,050	32,233	20,771
June	544,580	39,540	46,016
July	287,823	38,373	21,318
August	396,743	36,071	36,162
September	363,505	18,991	37,513
October	302,456	14,108	20,713
November	295,045	21,429	13,211
December	254,676	14,612	21,538
Total	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	492,707	17,075	29,811
July	458,866	29,647	17,243
August	431,484	22,645	20,920
September	409,200	22,724	18,113
October	452,015	17,296	11,853
November	434,297	13,929	7,042

10,182 tons in November, 1920, against 1299 tons in November, 1919; the Dutch East Indies received 2140 tons in November, 1920, against 3838 in November, 1919, while Argentina, which received none in November, 1919, imported 7663 tons in November, 1920.

Steel plate exports aggregated 79,424 in November, 1920, against 63,684 in November, 1919, and 91,093 in October, 1920. Steel sheets reached an export total of 16,064 tons in November, 1920, against 13,147 tons in November, 1919, and 17,129 tons in October, 1920. The exports of structural iron and steel were 42,839 tons in November, 1920, against 22,939 in November, 1919, and 53,989 in October, 1920.

The increases of the values of the exports compared with the figures for a year ago, were spread over a long list of items. Sheets and plates showed an increase of \$3,500,000 in November, 1920, over the figures for November, 1919; wire and manufactures of wire showed an increase of \$3,250,000; pipes and fittings, \$2,400,000; structural iron and steel, \$2,000,000; nails, \$1,340,000; rails \$800,000; hoops and bands, \$310,000; scrap, \$245,000; and bar iron, \$240,000. Billets, ingots and blooms showed a decrease in value of \$270,000; tin and terne plate, \$110,000, and pig iron, \$35,000.

The largest increase was recorded in favor of the exports of machinery, which aggregated \$41,659,698 in November, 1920, against \$34,103,136 in November, 1919;

Imports of Iron and Steel

	Gross Tons		Gross Tons	
	November 1919	November 1920	November 1919	November 1920
Ferromanganese	6,921	7,091	29,595	53,830
Ferrosilicon	1,388	710	8,623	13,592
All other pig iron	14,574	35,313	50,670	153,381
Scrap (including tin scrap)	15,673	5,642	157,075	136,513
Bar iron	220	112	1,574	4,682
Structural iron and steel	168	225	958	1,479
Steel billets without alloys	3,777	447	9,432	19,165
All other steel billets	278	264	2,321	4,252
Steel rails	480	309	15,736	44,061
Sheets and plates	244	203	1,005	1,697
Tin and terne plates	73	22	224	344
Wire rods	32	654	236	5,246
Total	43,828	50,992	282,465	438,242
Manganese, oxide and ore of	71,694	74,477	296,968	542,189

ber, 1920, these exports aggregated \$990,044,873 against \$908,127,729 for the same 11 months in 1919.

During November, 1920, the exports of iron and steel aggregated 434,297 tons against 452,015 tons in October, 1920, and 295,045 tons in November, 1919. This resulted in an aggregate of 4,402,056 tons in the first 11 months of 1920, against 4,202,823 tons in the corresponding months a year ago.

The exports of pig iron, including ferromanganese

and \$40,587,520 in October, 1920. For the 11-month period ended November, 1920, machinery exports aggregated \$412,612,129, against \$351,916,828 for the corresponding months of 1919.

The exports of engines and engine parts aggregated \$10,907,453 in November, 1920, against \$11,576,296 in November, 1919, and \$12,594,994 in October, 1920. This meant a total of \$133,363,792 for the first 11 months of 1920, against \$113,016,331 in the same months of 1919. The exports of metal working machines in November, 1920, was only \$3,331,623 against \$4,546,045 in November, 1919, and \$3,332,859 in October, 1920. For 11 months these exports aggregated \$40,545,526, against \$55,102,262 for the same period of 1919. Sugar mill machinery exports aggregated \$4,437,492 in November, 1920, against \$2,393,163 in November, 1919. For the 11 months this amounted to a total of \$18,733,236 in 1920, against \$12,479,028 in 1919.

The imports of iron and steel in November, 1920, aggregated \$3,854,950, against \$3,621,052 in November, 1919, and \$4,851,522 in October, 1920. For the first 11 months of 1920, these imports aggregated \$47,346,249 against \$23,366,959 for the same months of 1919. The tonnage figures showed an importation of 50,992 gross tons of iron and steel in November, 1920, against 43,828 tons in November, 1919, and 39,786 tons in October, 1920. For the first eleven months of 1920, these imports aggregated 438,242 tons against a total of 282,465 for the first 11 months of 1919.

The imports of the various forms of pig iron amounted to a total of 43,114 tons in November, 1920, at a valuation of \$1,319,389, against 22,883 tons, worth \$1,016,446 tons in November, 1919, and 23,877 tons, worth \$1,429,809 in October, 1920. There were also imports of 107,814 tons of iron ore in November, 1920, against 89,933 tons in November, 1919. The ore imports from Cuba aggregated only 62,215 tons in November, 1920, against 78,450 tons in November, 1919.

In November, 1920, the imports of manganese ore and oxide of manganese aggregated 74,477 tons, worth \$1,080,429; against 11,694 tons, worth \$536,148 in November, 1919; and 44,700 tons at a valuation of

Exports of Machinery

	November		Eleven Months	
	1919	1920	1919	1920
Adding machines	\$208,087	\$950,779	\$3,642,668	\$6,021,247
Air-compressing machinery	189,108	577,938	3,360,352	4,828,686
Brewers' machinery	7,178	23,075	156,222	454,564
Cash registers	504,999	326,466	3,778,542	4,958,342
Parts of	26,192	37,841	264,236	440,529
Concrete mixers	50,978	129,386	217,239	815,093
Cotton gins	2,348	19,729	292,114	402,403
Cream separators	41,100	65,651	1,053,630	1,632,192
Elevators and elevator machinery	82,043	207,317	2,475,645	1,344,814
Electric locomotives	37,204	827,992	861,580
Gas engines, stationary	92,868	99,557	626,882	759,706
Gasoline engines	1,884,344	2,486,704	36,674,565	33,020,305
Kerosene engines	568,140	796,475	7,574,997	9,843,090
Steam engines	1,466,198	3,319,546	29,049,781	52,507,487
All other engines	187,176	230,011	3,202,040	3,994,434
Boilers	976,528	1,112,549	3,960,807	7,109,880
Boiler tubes	269,633	698,244	7,635,249	9,178,955
All other parts of engines	6,840,783	2,224,367	28,201,638	20,100,536
Excavating machinery	139,131	192,712	1,027,660	1,860,053
Milling machy. flour, grist	251,876	207,286	2,268,838	1,670,520
Laundry machinery, power	145,739	99,824	744,791	1,076,284
All other	31,893	107,353	352,016	727,702
Lawn mowers	17,601	45,253	455,298	359,236
Lathes	647,801	589,444	9,529,145	6,945,529
Other machine tools	1,006,344	1,131,461	11,653,383	12,696,304
Sharpening and grinding machines	438,979	237,395	5,249,197	3,631,197
All other metal working machinery	2,452,721	1,373,323	28,670,537	17,372,496
Meters, gas and water	50,970	59,381	709,994	652,557
Mining machinery, oil well	453,885	736,125	3,264,792	1,115,823
All other	579,462	654,277	8,805,558	7,053,748
Paper mill machinery	157,136	435,694	3,612,740	2,653,843
Printing presses	422,141	927,521	3,326,894	8,161,140
Pumps and pumping mchy.	758,104	1,369,373	8,262,490	11,595,438
Refrigerating and ice making machinery	150,544	410,699	2,022,065	3,350,351
Road-making machinery	88,973	122,661	922,815	1,184,158
Sewing machines	1,191,229	1,382,638	11,518,947	14,133,006
Shoe machinery	144,770	322,340	2,546,848	2,274,642
Sugar-mill machinery	2,393,163	4,437,492	12,479,028	18,733,236
Textile machinery	1,342,595	1,681,168	13,933,096	18,141,294
Typesetting machines	228,384	326,427	3,640,386	4,417,061
Typewriting machines	1,258,395	1,757,750	15,763,402	22,649,635
Windmills	90,709	387,559	977,577	1,924,384
Wood-working mchy., saw mill	35,671	127,363	1,085,099	1,042,641
All other	223,058	347,197	2,380,855	3,257,034
All other mchy. and parts of	5,957,955	8,874,087	67,718,780	85,470,053
	\$34,103,136	\$41,659,698	\$351,916,828	\$412,612,129

\$948,169 in October, 1920. For the first 11 months of 1920, the manganese imports aggregated 542,189 tons, worth \$11,071,228, against 269 tons valued at \$10,481,110 for the first 11 months a year ago. O. F. S.

Little Business on the Pacific Coast

SEATTLE, Jan. 10.—The close of the year finds local conditions in iron and steel virtually stagnant, and there is nothing in sight to indicate a renewal in demand in the near future. Local sales managers of the Eastern steel companies say they are not trying hard to do business, as they know their trade is not in a buying mood. Jobbers are taking inventory and cleaning up the year's business as well as they can, and say they will not place orders with the mills until low stocks demand it. All local sales managers would be glad to quote the Steel Corporation prices if there were any new business coming up, but there is not, and not likely to be for some time. The feeling here is that it may be well into the summer before there is any distinct revival in demand for steel. The above also applies to the export inquiry.

It is believed that the contract for the nearly 6000 tons of reinforcing steel bars for the Ballantyne pier at Vancouver, B. C., will go to Canadian mills, as with all things equal, Canadian mills will have the preference, but it is possible the Steel Corporation, with its own line of boats, and its other advantages, may underbid the Canadian mills and take the business. Several independent mills that have bid on the business say they have no hopes of getting it. Ordinary soft merchant steel bars are being offered here by all sellers on the basis of 2.35c. at Pittsburgh mill. The plant of the Pacific Coast Steel Co., which rolls a good assortment of sizes in steel bars, is idle at present, repairs and additions being made. It will start soon.

Recently, several sales of sheets made some time ago for export, and contracts for which were cancelled by the foreign buyer, have been placed with domestic users in this district, and at the Steel Corporation prices.

There is no demand for tin plate, and the outlook for new business on the Pacific Coast in 1921 is very bad. The salmon packers have heavy stocks carried over from last year and the year before, they owe the bank's large sums of money advanced on these packs, in some cases more than the salmon could be sold for at to-day's prices.

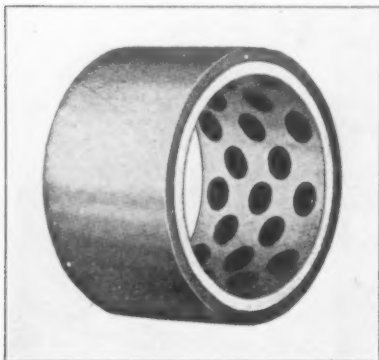
The Warren Axe & Tool Co., Warren, Pa., has been taken over by Lawrence Chamberlain & Co., New York, bankers; J. T. and T. J. Dillon, and a group of local business men. Lawrence Chamberlain & Co. have export connections and J. T. and T. J. Dillon have interests in the steel business in that section. Most of the stockholders in the old company have exchanged their shares for stock in the new organization. The personnel of the company remains unchanged. H. P. Stone has been elected president; T. J. Dillon, Welland, Ont., vice-president; W. A. Kinnear, secretary; H. W. Conarro, formerly of Struthers-Wells Co., treasurer and general manager. The board of directors consists of H. P. Stone, E. E. Allen, J. T. Dillon, T. J. Dillon, H. W. Conarro and C. S. Allen.

Frank L. Klingensmith, vice-president and treasurer, and Charles A. Brownell, advertising manager Ford Motor Co., Detroit, have resigned. Mr. Klingensmith's statement as to his resignation was as follows: "I have resigned from the Ford Motor Co. because I am not in full accord with some of the business policies contemplated by the company in the future. This disagreement has been present for the past year and has finally culminated in the present severing of my relations. Undoubtedly the many rumors afloat during the past few days have arisen from this condition and were the inevitable result of the situation."

Self-Lubricating Bearings

The Reliance Machine & Specialty Co., 101 Green Street, Jamaica Plain, Boston, is producing a new oil-less or self-lubricating bearing or bushing so designed that fewer manufacturing operations are required for their production than is the usual practice. They are machined, filled and burnished without being split, and, after being pressed into place, it is stated, give a perfect bearing surface.

Instead of being solid, or split cast metal, with surfaces ground, heated, and sweat together with solder and machined, these bushings are composed of two parts, an inner casing of bronze, and an outer casing of steel tubing machined to standard sizes for a driving or pressing fit. In some cases, when advisable, the outer casing is of bronze, and in others (if steel is



Reliance Self-Lubricating Bearing Consisting of an Inner and Outer Casing Joined by a Force Fit. Tapered holes in the inner casing are filled with the lubricating mixture under pressure

used) tinned to prevent rusting. The major operations in producing the Reliance bushings are: boring and turning the inner and outer casings, cutting to length, drilling the inner casing, filling the holes with lubricant, and assembling. Usual practice is to drill two sizes of holes to contain the lubricant, $3/16$ in. for small wearing surfaces, and $1/4$ in. for large. The Reliance company makes but one hole size, $1/4$ in., which insures a large lubricating surface irrespective of the dimensions of wearing parts. The ingredient for lubrication, it is explained, is much the same in all makes of bushings, the basis being pulverized lead with a certain per cent of graphite, and a small quantity of one other important ingredient. There is, however, some deviation in the binder used, mainly for the purpose of making claims as to the wearing life of the lubricant.

The shaft or pin holes in the bushings for sheave and block work are made larger than listed sizes to allow for running tolerance, and the bushings are made with the requisite allowance for a driving fit into the holes bored to the exact size, usually given as the outside diameter of the bushings. The bushings are furnished in any length and with any special inside or outside diameters required, also flange bushings of all standard sizes.

The inner casings are made of one thickness of wall, $3/32$ in. Instead of straight, tapered holes are bored, these being slightly larger on the outside than inside, which furnish a grip for the lubricant mixture thus to prevent it dropping from place. The nature of the inner casing and the patented process used makes it possible for great compression to be used in placing the lubricant in the recesses. Instead of inserting prepared lubricant plugs, the plugs in this instance are made directly inside the hole.

These inner casings or bearing surfaces are removable, in the event of the lubricant wearing below the point of usefulness, thus a new one can be inserted without the necessity of purchasing a new outer casing. The thickness of the outer casing depends entirely on individual requirements.

The J. N. Lapointe Co., New London, Conn., broaching machines, which has been closed for several days, resumed operations Jan. 6. The wages of the 100 odd employees have been reduced 20 per cent, and the weekly running scale reduced to forty hours.

The Washington Iron Works, Seattle, distributed \$16,000 in bonuses among its 250 employees at the holidays.

Shipbuilding Company Will Sell Surplus

SEATTLE, Jan. 5.—Jobbers are divided about equally in sentiment as regards the advisability of buying on the present level of steel prices, but the impression that the market has touched bottom for some time at least is becoming more general. It is established that several of the jobbers here at least will buy. There is a more sharply defined feeling of confidence since the end of the stock-taking period, but beforehand there will probably not be any attempt to accumulate warehouse holdings.

The larger operators feel that the trend of the steel demand will develop early this month, and continue slowly until March or April. The disconcerting factor in this idea is the heavy surplus of shipyard stocks that has been thrown on the market during the past six months as the war-time speed-up pace slackened off and it was found necessary to liquidate these holdings. The market has been overloaded in consequence with cleats, rivets, bolts and large sizes of pipe, brass goods and rods, but no sheets. The Todd Shipbuilding Co. is about to throw \$4,000,000 worth of these materials on the North Pacific coast markets.

Demurrage Due to Strikes

Industrial traffic authorities in the Mahoning Valley are anticipating new regulations by the Interstate Commerce Commission governing demurrage charges in case of railroad strikes, withholding of coal by the carriers to protect their own fuel supply, in the case of cars containing frozen ore and other commodities. These features of railroad transportation charges have been the subject of controversy between the railroads and the steel industry for a number of years. In each case it is expected there will be a substantial modification of the demurrage charges arising from delay in transit of cars held up by unusual circumstances. An agreement was recently reached between the National Industrial Traffic League and the American Railway Association, which the commission is asked to ratify, covering demurrage.

Burner Using Oil or Gas

A burner which converts kerosene or coal oil into combustible gas producing a blue flame is now being placed on the market by the Hauck Mfg. Co., 126



Blue Flame Burner

Tenth Street, Brooklyn, N. Y. Features emphasized are absence of flare-back, odor and noise. The burner when in full operation, it is stated, can be safely covered with a sheet of metal or asbestos so that the flame is prohibited from expanding fully, an advantage when working in close quarters where safety is necessary.

The oil consumption is rated at three pints per hr., at maximum, and two pints when throttled to a relatively smaller-sized flame. The flames generated by the 141 small holes in the burner can be increased until they converge into one large triangular flame 6 in. in height.

The outfit consists of a 5-gal. steel tank with fittings for holding the liquid fuel, a hand pump for forcing the oil to the burner by air pressure at 30 lb., 6 ft. length of copper oil tubing, and the burner proper, which is 14 in. long by 6 in. wide and 5 in. high. These dimensions, it is explained, adapt the burner to any standard gas stove hot plate.

Time study and motion study, being described as an indictment of stop-watch time study, was the subject of an address by Dr. Frank B. Gilbreth before the New York section of the Taylor Society, Dec. 16, 1920, and the address is now available in printed form and a copy can probably be had by addressing Dr. Gilbreth at 68 Eagle Rock Way, Montclair, N. J. The subject is approached from the standpoint of planning and controlling industrial processes.

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ESTABLISHED 1855

THE IRON AGE

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First Indications of 1921

The time element in the price readjustments of 1921 is admittedly important. Though a good deal was said three months ago of improvement in demand after the beginning of the new year, more recent estimates have moved the time forward. January never did bring buying after a period of waiting, and March is now a center of some expectation, in view of the long suppression of wants in so many quarters. Without doubt sentiment has been helped already by the advance in the stock market, even granting that this was a technical rebound from overselling and not any definite effort to discount a more favorable turn in actual business months hence. It is doubtless true, also, that the increased volume of general business due to the stimulating of individual buying by the reduction of retail store prices since the holidays has been a help, as have the various resummptions in industry, even though known to be for the working up of small accumulations of orders. Active liquidation of important stocks of various commodities has been under way, moreover, and the money market has shown a measurable and expected release from the strain of many weeks.

Reductions in wages have come in the first 10 days of the new year, and it is known that other such reductions are yet to come. Conditions in iron and steel, foundry and all metal-working industries are such that labor costs must be reduced so that market prices of product can be further liquidated. All such reductions are on the expectation that the cost of living—retail prices of food and clothing in particular—will continue to fall. Statistics of the Department of Labor gathered in eight cities have been published in the past week, showing that the cost of living for a standard family in December, 1920, represented a decline of from 11 to 19.5 per cent from the peak of June, 1920. However, the average is still from 93 to 118 per cent above the level of December, 1914, which is the basis of calculation. The slowness of the readjustment of living costs points to a decline in the purchasing power of the wage earners of the country as a feature of the situation that will last for a considerable part of the year.

While no important development was to be expected merely from crossing over into 1921, there is undeniable encouragement from the widespread feel-

ing that already has found expression in various sections and in various lines of business, that the readjustment is proceeding with less serious consequences than had been feared.

Special Legislation Unnecessary

The comment of labor leaders on the recent decision of the United States Supreme Court, declaring the secondary boycott illegal, has not been of the violent character that has characterized some of the utterances of prominent agitators in past years. For example, the president of the American Federation of Labor, who a few years ago did not hesitate to declare that he would violate the decision of the highest court in the land, now contents himself with remarking that the protest of minorities one day has frequently been the decision of majorities the next day. The secretary of the same organization indulges in the customary talk about the "attitude of Federal courts when human rights and dollars are involved." One of the union leaders, however, goes a little further and says:

Direct action accomplished with radical leadership seems to be the only weapon by which labor can gain its rights, now that a reactionary Supreme Court has taken from organized labor its only moderate and sane method of action.

Perhaps such comment from a closed-shop advocate should not be received with surprise, but it is surprising to note the comment of such a newspaper as the *New York Evening Post*, which remarks that, while it finds it impossible to approve the statements in the above paragraph, they must be taken into account as "evidence of the inevitable human reaction to the decision." In other words, the *Post* comes to the astonishing conclusion that, the secondary boycott having been declared illegal, the natural reaction brings a conclusion that no moderate or sane method remains. The editor ignores the possibility of resorting to a campaign of education or other reasonable methods, and goes on to show how labor unions in England brought about the trades disputes act of 1906, conferring special privileges upon the trade union. He then declares that what is needed is more legislation to establish clearly the status and rights of trade associations, whether of workers or of employers.

The trouble is that there has been too much legis-

lation, particularly in the way of attempting to grant special favors to labor unions. The effort of the union leaders to gain exemptions for their organizations from the provisions of the Sherman act, as interpreted in the Danbury hatters' case, was recorded in the passage of the Clayton act, but that last attempt to obtain special favor has now been declared null and void, and it is not likely that at any time in the near future Congress will listen to appeals to grant special favors to the unions whose leaders are now denouncing the Supreme Court. The amended anti-trust act, as interpreted by six of the nine justices of the Supreme Court, promises to exercise wholesome restraint on labor unions, and if it also prevents illegal actions of employers, no one will have reasonable cause for complaint.

The Budget of National Activities

Mistakes are often made in attempts to forecast the future of an industry through failure to recognize that the sum total of activities of the people is a sort of budget. There is only so much working capacity and when men are working at one thing they cannot be working at other things. Various new industries have grown rapidly, but an industry cannot grow indefinitely at a greater rate than industries grow as a whole.

One or two illustrations may be mentioned. In 1887 12,987 miles of new railroad was built in the United States, while the annual average in the 20 years following was about 3250 miles. In the course of time the supply of railroad mileage would become sufficient, or enough labor and effort could not be spared from other activities to permit the pace of new building to be continued. That, indeed, is what has occurred since 1907. It may be claimed, however, that while great mileages of new road cannot be built from year to year, the existing lines can grow through there being greater density of traffic. Precisely that has occurred. Over a long period of time there has been a doubling in the freight ton-mileage of the railroads about once in every 12 years, the average annual rate of increase being a trifle over 6 per cent. Economies in man power exerted per ton-mile have been introduced, but they have done little toward offsetting the increasing burden, nor does the increase in population suffice to cover the balance, since at a rate of 20 per cent increase per decade that represents a doubling in 35 to 40 years.

The business of railroading grew until railroad employees constituted a very considerable part of the total number of workers. This position being attained, the employees became highly organized and set about to reduce the quantity of work done per day. Obviously we cannot continue indefinitely to double the ton-mileage of freight every 12 years.

Another illustration of the principle referred to is furnished by the coal industry. The coal mining industry is about a century old. Production in 1821 was 1322 tons, all Pennsylvania anthracite. In each of the early decades production was multiplied several fold, and in each decade through 1890 there was more than a doubling. From 1890 to a point between 1916 and 1917 there

was a quadrupling, so that the last two doublings required an average time of about 13 years each. Coal mining methods are being constantly improved, but the miners, like the railroad employees, have become a large part of the working population, are highly organized and have been seeking to reduce the quantity of work done per man per day.

In neither of these cases can the country stand the rate of increase that formerly obtained. The *reductio ad absurdum* is that in the course of time half the workers would be engaged in mining coal and the other half in transporting coal and other commodities. Yet in neither of these industries is there observable up to date any definite trace in the statistics of their tending to slow down in keeping with the eventual necessity.

In its early stages an industry can grow at the expense of other industries it supplants, the railroad at the expense of the stage coach, the coal industry at the expense of hand driving of machinery, as in turning grindstones. Eventually the supply of supplantable labor runs out, and the industry has little chance to grow except in proportion to the increase in population plus the aid furnished by improvements reducing the effort expended per unit of output.

In the budget of the nation's activities coal production and railroading can have only a certain place. They cannot crowd everything else out. The same is to be observed of iron and steel production and consumption; but in the iron industry the slowing down in the rate of increase began some time ago. There is no break-neck pace, no moving up to an *impasse*. The work of producing and consuming iron and steel has not become an awkward burden. There have been great improvements in methods whereby the manual effort per ton of output has been greatly reduced, and there has been replacement of other industries. The industry is not crowding the other industries that make up the budget of activities.

Large French and Belgian Exports

Our cables from England have mentioned frequently of late the appearance of keen competition from Belgium and other continental countries in iron and steel. Its extent has not been represented in statistics, but the inference from recent data is that it has been gaining headway rather rapidly.

A statement of French and Belgian steel exports shows that since January, 1920, France has increased her exports of iron and steel and manufactures thereof nearly eight fold, while those of Belgium have been augmented nearly three fold. In January, 1920, French exports were only 11,800 tons, but in August they were 81,600 gross tons, while 94,500 tons was sent out in July. Belgium in January last exported only 36,700 tons, while in August and September the movement was 99,900 tons and 99,600 tons respectively.

Pre-war records make the comparison still more interesting. In 1913, Belgium's iron and steel exports were 128,800 tons per month; in 1919 they had fallen to only 14,500 tons per month. Thus by October, 1920, the recovery was

to about 77 per cent of the pre-war movement. France, however, greatly exceeded this record or that of any other country. In 1913 the French iron and steel exports were 48,200 tons per month and fell to 19,400 tons per month in 1919. For June, July and August the monthly average was 92,600 tons per month, indicating an increase of nearly 100 per cent over 1913.

While statistics are not given for German exports, their tendency to increase since the armistice is well known. More and more the competition of these three countries will be felt. The efforts of France and Belgium are both surprising and highly commendable. They explain in part the decline in British steel exports in recent months to a figure in the last quarter of 1920, only about 60 per cent of the 1913 rate. Even the United States, with its record exports of 1920, will ultimately feel the growing recuperation of these war-worn nations.

Electric Furnace Progress

The extent of the advance of the American electric steel industry in 1920 was a surprise. Measured by the number of new installations the net gain was 10 per cent, as brought out by our annual review of the industry published last week. The actual increase in the past two years was at least 25 per cent, measured by total sales made. The net increases of 33 new furnaces in 1920 and 36 in 1919 compare with 54 in 1918; 97 in 1917 and 63 in 1916. It was not expected that the after-the-war developments would be so favorable.

The conclusion is that the electric furnace has taken a place in steel metallurgy that is permanent. While its progress has been along the usual lines of steel ingot and casting production, it will probably continue in this direction, for the demand for high grade steels and for alloy steel castings will not lessen in the future. The most prominent field for future development is acknowledged to exist in the cast iron industry. Already there are several instances of the commercial use of electrically refined cupola iron, with results that are noteworthy. There is also the possibility that, as the higher grade ores are used up, electric refining at some stage or in some degree will be a procedure at steel plants, large and small.

The strides made by electric steel, not only in the United States, but in the world in the last decade, is the outstanding feature of steel metallurgy. In March, 1910, there were but 10 electric furnaces in this country and 104 in other countries; to-day there are 356 in the United States and over 600 in other lands. Then Germany was predominant, to-day the United States is well in the lead, with every probability of continuing to lead.

A small hand chart, printed in colors on celluloid, has been issued by the Firth-Sterling Steel Co., 310 Hudson Street, New York, showing heat treatment colors and the approximate temperatures at which they appear on both the Fahrenheit and Centigrade scales. On the reverse side of the chart is given a table of decimal equivalents of fractions of an inch by sixty-fourths. The card is an improvement over paper or cardboard as the celluloid is unaffected by grease and dirt.

BUYING IN EUROPE GROWS

American Exporters Follow Example of British, Japanese and Others—Japan Shows Activity

NEW YORK, Jan. 11.—There is a growing tendency among exporters to fill export orders from European sources. While this method of trading is confined to a few companies at present, it is evidently proving satisfactory. A recent example of Continental buying was the purchase in Germany by a New York exporter of about 125 tons of steel bars for February-March delivery, c.i.f. Japan. Another exporter, formerly engaged in active exporting of raw materials and alloys to Belgium, found it necessary, in order to compete with Continental sellers, to purchase two carloads of steel bars in Belgium for delivery to the Dutch East Indies. A large Japanese export house is now buying heavily through its London and Hamburg branches, finding better prices on nails, wire, sheets, plates and bars in Germany, whence the material is shipped to far Eastern markets. Although the German quotations are slightly lower than the prices of Belgian mills, delivery is from three to four months, against about six to eight weeks in Belgium, according to exporters who have made purchases in these countries. The greatest danger in these transactions, according to these exporters is the slight fluctuation in exchange, which may wipe out the expected profit if it is figured too closely.

While Japan is in much the same condition that has prevailed during the past eight or nine months, a few orders are being received and inquiry is slightly better. One exporter recently booked an order for about 90 tons of structural shapes and there are several fair sized inquiries for tin plate in the market as well as small inquiries for spring steel from both Japan and the Dutch East Indies. The inquiry for 50 miles of 100-lb. rails issued some time ago by the Manchurian Railroad has been placed with the Steel Corporation through a Japanese export house. It totals about 7800 tons without accessories. A fairly large order for car couplings for the South Manchurian Railroad has been placed with the National Malleable Castings Co. through a Japanese export house.

German locomotive builders were recently awarded the construction of a number of light locomotives for Japan at a price about 35 per cent less than the bids of American shops. Another inquiry issued about 10 months ago by the Imperial Japanese Government for material for constructing light locomotives has been revived and the order may be placed shortly. During the present condition of dullness, an iron and steel export company in New York has engaged in light trading by barter with Russia through Vladivostok and with Germany, handling merchandise of all kinds.

The Iron Age and Its Readers

While THE IRON AGE for the year 1920 was no notable exception in respect to the volume of reading matter, it is worth noting that in the past year it has supplied the equivalent in number of words of a modern novel every week. To satisfy the diverse interests of producers and manufacturing consumers of iron and steel and metal working machinery, constant thought has been given to the developments in metallurgy and in plant design, equipment and operation for iron and steel making and rolling, forging, casting and general working of metals. At the same time more space than ever has been given to the labor, economic and other news of the industry, both at home and abroad. THE IRON AGE has the chief of all trade fields and it has never lost sight of its obligation to reflect the caliber of the men who have made the iron industry great.

SMALL APPROPRIATIONS

Bureau of Standards Granted Much Less Than Expected for Scientific Work

WASHINGTON, Jan. 11.—The new Appropriations Committee of the House of Representatives has been even more stringent than last year's committee in its reductions in the appropriations for the Bureau of Standards and the Bureau of Foreign and Domestic Commerce. In the legislative, executive and judicial appropriation bill reported to the House, the committee had cut the request of the Bureau of Foreign and Domestic Commerce from \$2,000,000 to \$916,510—the appropriation made a year ago. The Bureau of Standards asked for \$2,129,440 and received \$917,360, a reduction of \$300,000 from the \$1,217,360 appropriated a year ago.

Dr. R. S. MacElwee, chief of the Bureau of Foreign and Domestic Commerce, and Dr. W. S. Stratton, Chief of the Bureau of Standards, pleaded in vain with the committee for the increased appropriations and higher salaries. But the committee declined to grant any increases in salaries, or to authorize extension of the work of the Department of Commerce.

"One of the most vital necessities of the service is higher scientific salaries," declared Director Stratton in his futile plea. That is a most serious matter. "It is a well-known fact that these people are being picked up everywhere, that salaries outside are double what they are in the Government, and were so before this condition came about. I have submitted these same salaries several times. In fact, I think the records will show that the estimates have gone to the department for the past five or six years. We have eight or ten heads of work who certainly should be increased, and other bureaus in the Government service, of course, are in precisely the same fix, but I think you hardly realize what has happened to the Government service, to its scientific and technical work during the past two years." Director Stratton asked for \$70,000 for metallurgical research and was given \$40,000 on the promise that this would include the work of investigating railway equipment, wheels and rails. Last year the Bureau was given \$25,000 for metallurgical research, and \$15,000 extra for railway investigations.

"We have combined the metallurgical research work with the investigation of railroad materials," said Dr. Stratton. "That provides for the operation of our metallurgical department, in which we are doing a large amount of work for both of the military branches, for the other Government services, and a good deal for the public. A few days ago, there was a meeting at the Bureau of Standards of 15 or 20 of the best metallurgical people, and we were discussing this work. I asked them 'What is the most important problem before you today in this line of work?' They said, 'The question of gas in metals.' They said if we could devise a way to get rid of gas in metals when they are cast, it would be of untold value to the whole metallurgical industry, both the steel and the non-ferrous."

"Have you discovered a method yet for taking pipe out of rails?" asked Representative Wood.

"Yes, sir," was the reply, "and it is being used. Our part of the work was carried on under the railroad fund. I do not say that we have had all to do with that, but we have kept the thing going and contributed much of the scientific data. The serious matter there is that we are being called upon by the Government service for a great deal of work here, and much of it is work that they will pay for, but we cannot depend upon those transfers from the Government services to provide for our leading men in any one of these lines of research."

Director Stratton asked \$250,000 for technical investigations of problems in industrial development following the war; the committee allowed him \$50,000, duplicating last year's appropriation.

For the investigations of structural materials the committee put \$125,000 into the bill instead of the \$175,000 asked for. This will duplicate last year's appropriation.

The committee also allowed \$25,000 instead of \$50,000 asked for the investigation of the fire-resisting properties of building materials.

Director Stratton told the committee that the Bureau has almost completed its tests of the fire-resisting qualities of the "metal column."

"When a building burns and the structural steel work gets hot," said Director Stratton, "it fails. The next is the fire-resisting property of the coating, an entirely different line of work. Steel columns of a known shape were covered with terra-cotta cement and various other things, and a relative value of these coatings was determined."

The committee also allowed \$10,000 instead of \$15,000 for investigations of high-temperature measurements.

"Nearly all of our industries that use furnaces, explained Dr. Stratton, "are now introducing the pyrometer method of high-temperature measurement, and the standardization involved is a very difficult subject to handle. We have found during the present year that this work has been productive of a great deal of good. In several lines the success of American manufactures in competition with foreign makes depends on pyrometric control."

Steel Corporation Extensions at Duluth

DULUTH, MINN., Jan. 10.—The plans of the United States Steel Corporation for the extension of the Minnesota Steel Co.'s plant have been discussed for some time here in their supposed relation to the outcome of the Pittsburgh basing case. If Pittsburgh basing is abolished, it has been argued by some business interests here that further blast furnaces and steel mills would be built at West Duluth. Conservative opinion is, however, that this is not likely, at least for the next few years. One year ago it was announced that the Steel Corporation plans for wire rod and wire mills here would involve an outlay of \$2,500,000. It was officially announced also that other finishing mills would be built later, the total program covering over four or five years involving a \$9,000,000 outlay.

It is definitely determined to push to completion the work under way for some time. This will mean an outlay of \$5,000,000 to \$6,000,000. The rod and wire mills will be completed and additions to the 28-in. rail mill. Additional generating equipment will be provided in electric power station No. 2 and boilers in boiler plant No. 2. Ore, coal and limestone storage facilities will be considerably enlarged. The new work will also involve town site extension and additional dwellings for employees.

In case the Pittsburgh basing is abolished there are indications that one or two independent companies will build new plants in this territory or the Chicago district.

Tariff Hearings Begin

WASHINGTON, Jan. 11.—Hearings on the general revision of the tariff have been begun before the House ways and means committee. The metal schedule, including iron and steel and related products, comes up on Wednesday, Thursday and Friday of the present week. A large delegation of steel men is expected to be in attendance.

The committee heard about 70 witnesses on Schedule A relating to paints, oils and chemicals on Thursday, Friday and Saturday of last week. Schedule B, applying to earth, earthenware and glassware, was under consideration the early part of this week.

The American Brass Co., Kenosha, Wis., resumed operations Jan. 3 with a force equal to the number employed when the plant was closed for inventory and stock adjustment about the middle of December. The plant is now working on a straight 8-hr. schedule.

Iron and Steel Markets

THE FUTURE OF PRICES

Some Concessions on Ship Plates and Bar Iron

Railroads Need Money Held Up by Government—Equipment Pending

Ten days of the new year have brought little change in the rate of mill operations or in the buying of steel. A few plants which shut down completely before the holidays have resumed in part, but it is frankly said that even such activity will be short lived unless larger demand develops this month. In the Pittsburgh and nearby districts independent companies are running at about 25 per cent of capacity, the good work of the pipe mills pulling up lower percentages in other lines. Wage reductions at a number of Pittsburgh and Youngstown plants are looked for this month.

The Steel Corporation continues to operate most of its mills at more than 90 per cent of full capacity, with indications that this condition will be maintained through the winter. The daily average of 50,000 tons of product holds up and new bookings are somewhat under the 25,000-ton daily rate which was reported for a good part of December.

How long the Steel Corporation price level will be held is an uppermost question. In the few tests that have come, the corporation has adhered to its schedule, though on plates in particular other makers have quoted 2.50c., representing a cut of \$3 per ton. The size of the corporation's order book argues for its continued refusal to reduce its prices, even though competitors may quote lower. The unwillingness of buyers to place large orders until the result of the whole process of price readjustment is clearer may work against serious cutting for a time. There is no present indication of free contracting from any source.

December steel output fell off but 11 per cent from that of November, so that an ingot production of 40,000,000 tons for 1920 is indicated, against 33,700,000 tons in 1919.

Buying in all finished steel lines has been on a limited scale, representing material that must be had. In spite of unusual efforts to cut inventories, many manufacturing consumers have considerable stocks.

Sporadic activity appears in the building field in the Central West, Cleveland and Chicago reporting a number of projects. At Cleveland competition has resulted in very low prices for fabricated work.

In some cases foundries serving the automobile industry have been asked to ship castings on orders suddenly canceled last fall. On the other hand is the complete stoppage of shipments on contracts of the Ford Motor Co.

Agricultural implement manufacturers are on a reduced scale of operations. One important interest has orders on hand equal to but one-third those of one year ago.

The Cambria Steel Co. has sold 3000 tons of rails to the Ann Arbor Railroad and 1000 tons to the Toledo Terminals Railway. An increase in the Santa Fe rail order from 40,000 to 50,000 tons is

an incident in railroad buying which unfortunately is not typical. Until railroad financing is made easier—and the payment of the Government's heavy indebtedness to the lines would do much in that direction—the steel trade can build no large hopes on new equipment orders.

The Algoma mill in Ontario, which at times has taken rail business away from the Chicago mill, is not likely to be troublesome this year, having Canadian rail bookings that will keep it busy for ten months.

The Louisville & Nashville is asking prices on 2700 cars and for 36 locomotives. A Southern Railway inquiry is for 60 locomotives and bids are going in on the steel.

Following the cut in bar iron last week in Chicago, bringing it \$1 per ton under steel bars, comes the reduction by one mill in the East to the steel bar level of 2.35c. In this case puddlers' wages were reduced and now the effort is to get work for them.

On 2300 tons of plates and shapes for a shipyard at the head of the Lakes, the plates are reported to be obtainable at 2.50c., Pittsburgh.

Sales of German and Belgian steel bars to Japan and the Dutch East Indies have been put through by American exporters, but the volume of such business is not large. Some considerable lots of steel left on the hands of New York exporters by cancellations from abroad will yet come upon the domestic market.

Further reductions in British pig iron prices amount to £1 and more. Structural shapes and round bars have declined by a like amount. But Continental steel continues to be offered in Great Britain at far below the domestic prices.

The general tendency of pig iron prices is toward lower levels. This is true in spite of the fact that the quotation of \$30, furnace, on Alabama iron, which appeared in the Chicago market recently, apparently has been withdrawn. In the East, some resales of foundry iron have been made as low as \$30, base, Buffalo and Boston districts, and quotations at other Eastern points are not much above the \$30 base. Prices of Jackson County silveries and ferrosilicon have been marked down \$6.50. Resale iron has disappeared to a large extent in Chicago, giving a somewhat firmer tone to that market.

Pittsburgh

PITTSBURGH, Jan. 11.

Buyers of iron and steel remain indifferent, and expectations either of larger purchases or releases against suspended orders have been unfulfilled to a very large extent. Independent companies began the year with comparatively small order books and naturally were dependent more upon new business than upon specifications to start up idle capacity. Resumption of operations is noted by a few companies which went down completely the week before the holidays, but it is frankly stated that the orders on the books of these companies are not sufficient to keep them running very long. Hence a considerable amount of new business will be required in the next few weeks. Much of the independent capacity which has been in operation has been engaged in producing for stock, it being stated in a number of cases, notably in cold-finished steel bars,

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

A Comparison of Prices

Pig Iron, Per Gross Ton:	Jan. 11, 1921	Jan. 4, 1921	Dec. 14, 1920	Jan. 13, 1920
No. 2X, Philadelphia†....	\$33.25	\$34.79	\$34.79	\$44.35
No. 2, Valley furnace†....	33.00	33.00	36.00	39.00
No. 2 Southern, Cin'ti†....	36.50	39.50	42.50	41.60
No. 2, Birmingham, Ala.†....	32.00	35.00	38.00	38.00
No. 2, foundry, Chicago*....	32.00	32.00	35.00	40.00
Basic, del'd, eastern Pa....	33.86	33.86	33.86	39.25
Basic, Valley furnace....	30.00	30.00	33.00	37.00
Bessemer, Pittsburgh....	33.96	33.96	36.96	40.40
Malleable, Chicago*....	32.50	32.50	35.50	40.50
Malleable, Valley....	32.00	32.00	36.00	38.00
Gray forge, Pittsburgh....	33.96	33.96	36.96	38.40
L. S. charcoal, Chicago....	40.50	43.50	51.00	47.50
Ferromanganese, Atl. port. 100.00	100.00	100.00	110.00	140.00

Rails, Billets, Etc.,

Per Gross Ton:

Bess. rails, heavy, at mill..	\$45.00	\$45.00	\$55.00	\$45.00
O.-h. rails, heavy, at mill..	47.00	47.00	57.00	47.00
Bess. billets, Pittsburgh..	43.50	43.50	43.50	48.00
O.-h. billets, Pittsburgh..	43.50	43.50	43.50	48.00
O.-h. sheet bars, P'gh....	47.00	47.00	47.00	50.00
Forging billets, base, P'gh.	48.50	48.50	51.00	64.00
O.-h. billets, Phila....	49.24	49.24	49.24	59.10
Wire rods, Pittsburgh....	57.00	57.00	57.00	60.00

Finished Iron and Steel,

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.70	3.35	3.85	3.745
Iron bars, Chicago.....	2.68	2.68	3.25	3.00
Steel bars, Pittsburgh....	2.35	2.35	2.35	2.75
Steel bars, New York....	2.73	2.73	2.73	3.27
Tank plates, Pittsburgh..	2.65	2.65	2.65	2.65
Tank plates, New York...	3.03	3.03	3.03	3.02
Beams, etc., Pittsburgh..	2.45	2.45	2.45	2.45
Beams, etc., New York....	2.83	2.83	2.83	2.82
Skelp, grooved steel, P'gh.	2.45	2.65	3.00	2.45
Skelp, sheared steel, P'gh.	2.65	2.65	3.00	2.65
Steel hoops, Pittsburgh..	3.05	3.05	3.05	3.25

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above tables are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Jan. 11, 1921	Jan. 4, 1921	Dec. 14, 1920	Jan. 13, 1920
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	4.35
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	5.70
Sheets, blue an'd, 9 & 10.	3.55	3.55	3.55	3.55
Wire nails, Pittsburgh....	3.25	3.25	3.25	4.50
Plain wire, P'gh.....	3.25	3.25	3.25	3.25
Barbed wire, galv., P'gh..	4.10	4.10	4.10	4.45
Tin plate, 100-lb. box, P'gh.	\$7.00	\$7.00	\$7.00	\$7.00

Old Material, Per Gross Ton:

Carwheels, Chicago.....	\$21.00	\$21.00	\$24.00	\$36.00
Carwheels, Philadelphia...	25.00	25.00	27.00	35.00
Heavy steel scrap, P'gh....	15.00	15.00	17.00	26.00
Heavy steel scrap, Phila..	14.50	14.50	16.00	24.50
Heavy steel scrap, Ch'go..	15.00	15.00	16.50	24.00
No. 1 cast, Pittsburgh....	25.00	25.00	27.00	32.00
No. 1 cast, Philadelphia...	22.50	22.50	26.00	35.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	18.50	36.50
No. 1 RR. wrot. Phila....	20.00	20.00	20.00	33.00
No. 1 RR. wrot. Ch'go (net)	13.50	14.00	14.50	25.50

Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt....	\$5.00	\$5.25	\$6.00	\$6.00
Furnace coke, future....	6.00	6.00	6.60	6.00
Foundry coke, prompt....	6.50	6.50	7.00	7.00
Foundry coke, future....	8.00	8.00	8.50	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York..	13.25	13.75	14.00	19.50
Electrolytic copper, N. Y.	13.00	12.75	14.00	19.25
Zinc, St. Louis.....	5.50	5.60	5.90	9.37 1/2
Zinc, New York.....	6.00	6.10	6.00	9.72 1/2
Lead, St. Louis.....	4.85	4.75	5.00	8.62 1/2
Lead, New York.....	5.00	4.75	4.85	8.87 1/2
Tin, New York.....	38.75	36.00	33.00	65.00
Antimony (Asiatic), N. Y.	5.20	5.20	5.50	10.25

that on the basis of new orders there would be no justification for keeping the plants running. A careful canvass of the situation in the Pittsburgh and nearby districts indicates that no more than 25 per cent of the independent capacity to-day is active, and it is doubtful whether the average would be that high if it were not for practically full occupation of the pipe mills. There has been no decrease in the activities of the Steel Corporation subsidiaries, all of which are running as fully as is physically possible. The Carnegie Steel Co., with its Sharon, Pa., works down, is getting out almost a full ingot production, and it still has 47 of its blast furnaces in blast. The American Sheet & Tin Plate Co. has 95 per cent of its sheet mills and at least 80 per cent of its tin plate mills in operation, while the National Tube Co. is running full in all departments except in seamless tubes and boiler tubes. A relatively high rate of operation also is being maintained by the American Steel & Wire Co., although this company, in common with all producers of wire products, is feeling the lack of demand. Much surprise was occasioned here by the fact that the unfilled tonnage statement of the Steel Corporation for December did not show a larger decrease. All of the subsidiaries had been running at such a high rate that, in view of the fact that there were no hindrances to shipments, it was expected the decrease would amount to more than 1,000,000 tons.

The week has seen no important shading of the Steel Corporation prices by the independent companies, although it has been currently reported that one of the independents had taken a large tonnage of car plates at less than 2.65c.

Prices on pig iron recently established also have been pretty well observed, although reports have not

been lacking that less than these prices has been done. In both iron and steel, too little has been done to really test the market and the lack of any real interest on the part of buyers tends to check any tendency to secure business at the expense of prices at the moment. Present quotations are regarded to be as low as they can possibly be made without loss on present labor costs, and while wage reductions continue, the movement in this direction as yet has not assumed general proportions. There seems to be some fear of possible labor troubles, report being current that a number of industrial plants are freely stocking coal owing to the possibility that the railroad employees will not accept reductions which have been made or are being planned.

Pig Iron.—Business is entirely in carload lots, and it has not been necessary for producers to make any further price concessions to effect such sales. Important demand is absolutely lacking, and since the blast furnace interests regard present prices to be as low as they can go on present costs, they are inclined to stand pat and let the buyers open negotiations. Resale lots of all grades of iron probably could be bought at less than the furnace bases, but there is not much interest in these tonnages, and it is noted that holders are not quite so anxious to make sales as they were during the latter part of last year, when the losses would have counted in their tax returns. There have been reports that basic iron was being offered from Valley steel plants at well below the merchant quotations, but no sales were made and the common supposition is that the low price was named for tax purposes. The stack of the Weirton Steel Co., Weirton, W. Va., started up yesterday morning and No. 3 furnace of the

Shenango Furnace Co., Sharpsville, Pa., again is blowing. This increase is more than offset by the fact that the furnaces of the American Manganese Mfg. Co., Dunbar, Pa., and the Scottdale, Pa., furnace of McKinney Steel Co., have gone on the idle list. The leading independent steel company in this district has only four of its 12 furnaces making iron.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.96 per gross ton:

Basic	\$30.00
Bessemer	32.00
Gray forge	32.00
No. 2 foundry.....	33.00
No. 3 foundry.....	32.50
Malleable	32.00

Ferroalloys.—Jackson, Ohio, producers of Bessemer ferrosilicon and silvery iron in making quotations have gone back to the old Government differentials, using No. 2 foundry iron as the base. These differentials are as follows: Bessemer ferrosilicon, 10 per cent, \$23; 11 per cent, \$26.30; 12 per cent, \$29.60; 13 per cent, \$32.90; silvery iron, 6 per cent, \$10; 7 per cent, \$11.50; 8 per cent, \$13.50; 9 per cent, \$15.50; 10 per cent \$18 and 11 per cent, \$20.50. On a basis of \$35 for foundry iron this would mean a price of \$58 for 10 per cent Bessemer ferrosilicon, a decline of \$6.50 per ton from the former quotation, while 8 per cent silversies would go to \$48.50 as compared with the former price of \$55. The new quotations given below are based on No. 2 foundry iron at \$35, but this quotation is merely nominal and the present market is considered to be nearer \$32 to \$33. British makers of ferromanganese recently reduced their quotation on 76 to 80 per cent material to \$110 seaboard, and it is understood that they would take business for either prompt or deferred delivery at \$100. We revise our quotations accordingly. This change puts the English material to the basis of resale tonnages, but as yet domestic producers have not followed suit, nominally quoting \$140 to \$150 seaboard, for 76 to 80 per cent alloy and showing a disposition to hold to these prices, pending a cleaning up of resale tonnages.

We quote 76 to 80 per cent domestic ferromanganese at \$140 to \$150, seaboard British, \$100 to \$110 on direct sales; resale tonnages, \$100 to \$110 seaboard. We quote average 20 per cent spiegeleisen nominal at \$58 to \$60 furnace, on direct business and \$40 to \$45 for resale tonnages 50 per cent ferrosilicon, nominal \$75 to \$80 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, \$54.50; 10 per cent, \$58; 11 per cent, \$61.30; 12 per cent, \$64.60. Silvery iron, 6 per cent, \$45; 7 per cent, \$46.50; 8 per cent, \$48.50; 9 per cent, \$50.50; 10 per cent, \$53; 11 per cent, \$55.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is \$4.06 per gross ton.

Plates.—There is a positive dearth of new demand and not much capacity in this and near-by districts, except that of Carnegie Steel Co. is in operation. It is reported that the American Car & Foundry Co. has placed 10,000 tons of plates in connection with its order for cars from the Louisville & Nashville Railroad and that the business was placed with an independent company at less than 2.65c., but confirmation is lacking.

We quote sheared plates of tank quality $\frac{1}{4}$ in. and heavier at 2.65c., Pittsburgh, this being the quotation of both the Carnegie Steel Co. and the leading independents.

Structural Material.—Not only are inquiries for fabricated steel few, but those coming out entirely are for small tonnages. The shops are fairly busy, but this is entirely due to the existence of some old orders and a falling away in activities is probable before long unless there is a decided betterment in business soon. Little is going on in plain material and outside of the Corporation not much capacity is engaged. Prices are given on page 167.

Semi-Finished Material.—Demand in all forms is practically at a standstill and prices are nominal. Only carload lots of rerolling billets are sought and tonnages still owed on old contracts are not being specified against at all freely. This is a reflection of the extremely slow demand for finished products. Conditions in sheet bars and slabs are similar. The fact that independents are unable to secure much business in either sheets or

plates at the Industrial Board schedules, and that present prices are above the March 21, 1919 levels on sheet bars and slabs, may be advanced as a reason for the slow demand. Very little interest is observed in steel skelp despite the fact that the live orders in pipe are sufficient to keep most makers busy.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at \$43.50; 2 x 2-in. billets, \$47; Bessemer sheet bars, \$47; open-hearth sheet bars, \$47, and forging billets, ordinary carbons, \$48.50 to \$50 base; slabs, \$46; steel skelp, grooved, 2.45c.; universal, 2.55c.; sheared, 2.65c.; all f.o.b. Youngstown or Pittsburgh mill.

Wire Products.—New orders are few and small. Practically no interest has yet developed in barbed wire and sales by the independents of nails, plain wire and fencing, only in rare cases, are more than a carload. Business of the leading interest in this district is not heavy. All companies are quoting the Corporation prices and there are no suggestions that these figures are being shaded.

We quote wire nails at \$3.25 base per keg. Pittsburgh, and bright basic and Bessemer wire at \$3.25 base per 100 lb., Pittsburgh.

Tin Plate.—Business practically is at a standstill and independent capacity is either idle or operating at an unusually low rate even for this time of the year. Container manufacturers appear to be well covered against their requirements of the first quarter of this year, and as indications point to a light pack of fish and perishable food on account of existing heavy stocks, hopes do not run strong of much improvement in the demand until well into the second quarter. The American Sheet & Tin Plate Co. is faring better than the independents both in the matter of new business and in specifications, and has about 80 per cent of its mills in operation. There is close observance of the Corporation base of \$7 by the independent companies.

Cold-Finished Steel Bars.—New demands are entirely lacking from the automotive industry, and are few and small from other consumers. Generally the plants that are running are producing bars for stock, although one maker in this district reports a considerable gain in new orders so far this month over the same period in December. The market is steady at 3.60c. base, now quoted by all makers.

Nuts, Bolts and Rivets.—Both new orders and specifications against old ones are extremely limited. No radical departures from recently established prices are observed and the tendency is common to look upon present prices as low enough in view of the fact that they are back to the 1916 levels on nuts and somewhat below those of that period on bolts. Prices and discounts are given on page 167.

Wire Rods.—Demands are few and small, with buyers having no trouble in securing supplies at the Corporation base of \$57 for ordinary soft rods. Prices are given on page 167.

Iron and Steel Bars.—A further cut of \$5 per ton has been made in prices of iron bars by Pittsburgh makers, who now are quoting refined bars at 3.75c. base. The use of Pittsburgh as a basing point on iron bars has practically disappeared, all makers now quoting f.o.b. mill. Very little demand is coming out for iron bars and specifications against old orders are laggard. Steel bars also are slow of sale, as users having orders in with the Corporation now are getting good deliveries, especially in sizes of 1 in. or more. No important shading of prices by independent mills is noted.

We quote steel bars rolled from billets at 2.35c.; reinforced bars, rolled from billets, at 2.35c., base; common iron bars, 3.06c. to 3.25c., delivered Pittsburgh; refined iron bars, 3.75c., in carloads, f.o.b. mill, Pittsburgh.

Sheets.—Demands upon independent makers remain small. While bookings of the leading interest are below normal, it is getting a relatively large part of the current business and daily is receiving releases against suspended orders. This company still has about 95 per cent of its sheet mill in operation and is

getting out practically a full theoretic capacity production despite the number of mills not running. Its shipments are practically at parity with production and little or no tonnage is being stocked. The galvanizing departments are more fully engaged now than they had been before since the record year of 1912, and the general operations of the company are about triple the average of the independents. Demand from the automotive industry is nil, as only one or two companies are now operating and these at a very modest rate. Suspension of operations by the Ford Motor Co. threw back considerable tonnages of sheets, some of which were loaded on cars and ready to be shipped. No important shading of prices by independent makers is observed.

Iron and Steel Pipe.—The price reduction announced as of Dec. 31, 1920, by the Republic Iron & Steel Co. has been followed by all of the other independent companies in standard pipe, but two companies still are holding to their former schedules on oil country goods. Slump in the automotive industry and the lack of any important railroad buying have cut sharply into the demand for seamless tubes and in common with all other makers the National Tube Co. is experiencing an indifferent demand for boiler tubes. All other departments of that company are running practically full and its shipments are running about 150 per cent of production, as it is shipping freely from stock. Practically all of the independent capacity also is well occupied, as there is a good demand upon them due to the fact that the leading interest is choked with business and taking on no new accounts. Jobbers' stocks of standard pipe are low and they are specifying fairly freely while the recent decline in oil prices has found no reflection in the demand for oil well or line pipe. Discounts are given on page 167.

Steel Rails.—Independent makers of light rails still are holding to 3c. for 25 to 45 lb. sections and are able to effect sales at this price, because of the filled up condition of the Carnegie Steel Co. General demand, however, is very much lighter than it was a few months ago. Bookings on the Carnegie Steel Co. are said to be sufficient to engage capacity for six months.

Boiler Tubes.—New demands in both steel and iron are extremely limited and on the former there are no quotable discounts except those of the National Tube Co. Independent discounts on steel tubes vary considerably, but on such business as is being placed practically no advance over the National Tube Co. schedules is being obtained. Makers of iron tubes are holding to the old discounts pending their ability to secure lower costs, through lower wages. Discounts are given on page 167.

Hot-Rolled and Cold-Rolled Strip Steel.—No improvement can be chronicled in the demand nor in specification against orders which remained upon the books of makers at the beginning of the year. One large independent in this district resumed operations Monday morning, following a holiday suspension of about two weeks, but unless there is a considerable amount of new business shortly, it is improbable that this company can continue to run very long. All companies are quoting hot-rolled strips at 3.30c. base and cold-rolled at 6.25c., but these figures refer principally to deliveries against old orders and to a large extent they may be said to be untested.

Chain.—Leading manufacturers are holding to a base of 7.25c. for 1-in. proof coil steel chain, but admit the probability of an early reduction as both labor and materials costs are lower than they have been, while new demands are few and small and the unfilled tonnages are melting away rapidly. One interest has announced a cut of 15 per cent in wages and the elimination of extra remuneration for overtime.

Coke.—The market is an extremely narrow affair, as there has been no gain in active blast furnace capacity and the foundries still are going along at very much curtailed rates. The few blast furnaces which have resumed since the first of the year are covered by contract and are not obliged to seek spot sup-

plies. Although there has been a pretty progressive decline in beehive oven operations, spot supplies of both furnace and foundry grades still are sufficient for the demand. As low as \$5 per net ton, oven, recently has been done on odd lots of furnace coke and \$5.50 measures the top on such tonnages, although the fact that \$6 is being obtained against contract shipments makes operators rather indifferent about business at a lower figure. Contracting is at a standstill, as furnace interests are waiting the development of a more established market on pig iron, and foundry interests regard present quotations on their grade of fuel as altogether too high. The coal market remains extremely weak, and \$2.85 per net ton at mine now measures top on gas or by-product mine run grade, while steam coal is hardly quotable at above \$2.25 and sales of tonnages loaded on cars are reported to have been made as low as \$1.90.

Cut Nails.—The Reading Iron Co. has cut its price to 5c. f.o.b. Pottstown or Birdsboro, Pa., in carload lots and to 5.25c. for less than carload. LaBelle Iron Works is quoting the same prices, f.o.b. Wheeling. Demand is slow and sales few and small.

Old Material.—It is impossible to make any important changes in scrap iron and steel prices from those of the past few weeks, as there has been no increase in the consumptive demand and about the only buying that is noted is from dealers who have yards on which they can throw down their purchases. None of the independent steel companies in this district is in the market for supplies and dealers report continued inability to obtain releases against old orders. The Carnegie Steel Co. is reported to be taking any round tonnages of low-priced open hearth material that are offered, but is dealing direct with the railroads and other producers rather than with dealers. It is understood this company recently bought a good-sized tonnage of girder rails from the Pittsburgh Railways Co. at around \$17. When graded and cut to charging-box size, this material would cost around \$19. It also has secured railroad scrap at around \$17. Dealers have not been able to pick up much really cheap steel works scrap and show no disposition to meet this figure. As a matter of fact, at the cost of the material they have in their yards, they could not sell heavy melting steel for less than \$18 and get out whole.

We quote for delivery to dealers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh.....	\$15.00 to \$16.00
No. 1 cast, cupola size.....	25.00 to 26.00
Re-rolling rails, Newark and Cambridge, O.; Cumberland, Md.; Parkersburg and Huntington, W. Va.; Franklin, Pa., and Pittsburgh.....	17.00 to 18.00
Compressed sheet steel.....	13.00 to 14.00
Bundled sheet sides and ends, f.o.b. consumers' mills Pittsburgh district	11.00 to 12.00
Railroad knuckles and couplers.....	15.50 to 16.50
Railroad coil and leaf springs.....	15.50 to 16.50
Railroad grate bars.....	17.00 to 18.00
Low phosphorus melting stock, bloom and billet ends, heavy plates ¼-in. and heavier.....	24.00 to 25.00
Railroad malleable.....	16.00 to 17.00
Iron car axles.....	36.00 to 37.00
Locomotive axles, steel.....	32.00 to 33.00
Steel car axles.....	22.00 to 23.00
Cast iron wheels.....	22.00 to 23.00
Rolled steel wheels.....	15.50 to 16.50
Machine shop turnings.....	10.00 to 10.50
Sheet bar crop ends at origin.....	16.00 to 17.00
Heavy steel axle turnings.....	14.00 to 15.00
Short shoveling turnings.....	13.00 to 14.00
Heavy breakable cast.....	19.00 to 20.00
Stove plate.....	17.00 to 18.00
Cast iron borings.....	13.00 to 14.00
No. 1 railroad wrought.....	16.00 to 17.00

A jobbing warehouse, 100 x 350 ft., will be erected by the Sheet Metal Mfg. Co. on an eight-acre site at Youngstown, Ohio, near the plant of the Brier Hill Steel Co. The building will have special equipment for loading and unloading stocks of sheets and plates. It is the purpose to inaugurate regular truck deliveries to consumers in the Mahoning and Sehnango valleys. Thomas E. Farrell is president of the company, Clifford D. Watson, vice-president and John J. Farrell, Jr., secretary and treasurer.

Chicago

CHICAGO, Jan. 11.

The market is more cheerful in sentiment, although little new business has actually developed. The receipt of some requests for the shipment of suspended orders, particularly of pig iron, is regarded as a hopeful sign. In some cases foundries serving the automobile industry have been authorized to ship finished castings on orders which had been suddenly canceled some time ago. Notwithstanding indications of improvement in the automobile industry, the Ford Motor Co. recently stopped all shipments on unfilled orders for steel, castings and machinery. Agricultural implement manufacturers are on a reduced scale of operations.

One important interest which had six million dollars' worth of orders on its books a year ago now has bookings amounting to hardly \$2,000,000. Although pig iron is on a firmer footing because of the disappearance of a large proportion of the resale offering, buying of steel is at a minimum. A shipbuilder has bought about 2300 tons of plates, shapes and bars, a considerable portion of which at least was purchased at \$2 or more below the Industrial Board basis. In view of high costs, shading under the present level of prices is looked upon by the trade as a temporary condition which would soon disappear if even moderate market activity should develop. Deviations from the Industrial Board basis are not regarded as likely to be made except to secure attractive tonnages, which would enable mills to build up a new rolling schedule.

Production in this territory has undergone further contraction. The leading independent is operating none of its capacity except two blast furnaces. The Wisconsin Steel Co. continues to operate two out of three furnaces and 50 per cent of rolling capacity. Other independent mills are rolling little new work. One bar iron mill and all rail carbon steel bar mills in this section are idle. The Illinois Steel Co., on the other hand, continues to operate 22 out of 29 furnaces in this district and about 87 per cent of its finishing capacity. Its present bookings, after making due allowance for suspensions, insure operation for four months. Its shipments in December were the largest of any month in 1920.

The Algoma Steel Co. mill has Canadian rail bookings which will employ its capacity for ten months.

Ferroalloys.—The market is quiet and still unstable because of the presence of resale material. Ferromanganese is available both in resale lots and from furnace at \$100, delivered. Resale spiegeleisen can be had at from \$48 to \$50, delivered.

We quote 75 to 80 per cent ferromanganese, \$100 delivered; 50 per cent ferrosilicon, \$80 to \$85 delivered; spiegeleisen, 18 to 22 per cent, resale, \$48 to \$50 delivered.

Pig Iron.—The resale iron which flooded the market late in 1920 has disappeared in large measure and furnace quotations are on a firmer footing. The Ford Motor Co. will take no new business at less than \$33 base, Detroit, for No. 2 foundry. Offerings of Southern Foundry at as low as \$30 base, Birmingham, have apparently been withdrawn. It is possible that this price might still be quoted if an attractive inquiry appeared, as one or two furnaces have indicated that they would make concessions in competitive territory. For the present, however, the ruling range of Southern prices, \$32 to \$35 base, Birmingham, is too high to make that iron a factor in this market. At least one Northern maker will accept business at \$32 base, Chicago furnace, for No. 2 foundry, and the quotation of \$35, local furnace, recently announced by the leading merchant has become largely nominal. An important producer has marked down charcoal iron to \$37, furnace, or about \$40.50, delivered Chicago. Copper free low phosphorus is available at \$40, Eastern furnace. A Jackson County producer has reduced silvery to \$46.50, f.o.b. furnace, for 7 per cent, but a Tennessee furnace still has material to sell at \$43. Although there are few new inquiries before the trade, the re-

ceipt of requests for shipments against suspended orders is regarded as a very encouraging sign. The Chicago, Milwaukee & St. Paul is inquiring for 250 tons of malleable for January shipment. An inquiry for 500 tons of foundry for January and February shipment is on the market.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 70c. per ton:

Lake Superior charcoal, averaging sil.	
1.50, deliv. at Chicago.....	\$40.50
Northern coke, No. 1, sil. 2.25 to 2.75.....	\$33.25 to 36.25
Northern coke foundry, No. 2, sil.	
1.75 to 2.25.....	32.00 to 35.00
Northern high phos.....	32.00 to 35.00
Southern coke, No. 1 foundry and No.	
1 soft, sil. 2.75 to 3.25.....	41.67 to 44.67
Southern coke, No. 2 foundry, sil.	
2.25 to 2.75.....	39.92 to 42.92
Southern foundry, sil. 1.75 to 2.25.....	38.67 to 41.67
Malleable, not over 2.25 sil.....	32.50 to 35.50
Basic.....	32.00 to 35.00
Low phos. Eastern furnace (copper	
free).....	40.00
Silvery, sil. 7 per cent.....	47.53 to 51.82

Rails and Track Supplies.—The Santa Fe has bought 10,000 tons of rails for 1921 delivery from the local mill in addition to a previous order for 40,000 tons. There is moderate buying of tie plates, track bolts and spikes. Makers have reduced iron tie plates to 3.25c. mill. We quote:

Standard Bessemer rails, \$45; open-hearth rails, \$47; light rails, 2.45c., f.o.b. makers' mills.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.60c., Pittsburgh. Steel tie plates, 3c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.25c., f.o.b. makers' mills.

Bars.—The reduction in bar iron reported last week brought out a moderate amount of business, but not enough in the aggregate to warrant satisfactory mill operation. One bar iron mill is idle and others are on a reduced basis of operation. In the absence of demand, rail carbon steel bar mills are still shut down. Little new business in mild steel bars is developing, inquiry for concrete bars being perhaps a little heavier than for other shapes.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 2.68c., Chicago; rail carbon, 2.60c. to 2.75c. mill, nominal.

Jobbers quote 3.48c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.25c. for rounds and 5.75c. for flats, squares and hexagons, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. on orders up to 1000 lb. Jobbers quote hard and medium deformed steel bars at 3.48c. base.

Structural Material.—The Minneapolis Steel & Machinery Co. will fabricate 1000 tons for the Junior Orpheum Theater, Minneapolis. The Hydraulic Pressed Steel Co. will furnish 138 tons for a steel building at Houston, Texas. A contract for 313 tons for the marine railway, U. S. Naval Station, Pearl Harbor, Hawaii, has been awarded to the McClintic-Marshall Co. There is little demand for plain material.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.58c. for materials out of warehouse.

Plates.—Current buying is very much restricted, but the market is more cheerful in sentiment, largely because of business thought to be in prospect. On an inquiry from a shipbuilder for about 2300 tons of plates, shapes and bars, principally plates and shapes, a concession of \$2 per ton was offered on the plates by one mill and a cut of \$1.50 on both the plates and shapes by another interest. The business is not yet closed. This is the first instance of a deviation below the Industrial Board basis which has come to notice in this section, but in the East a car builder is reported to have bought 10,000 tons of plates for less than 2.65c., Pittsburgh. It is probably true that some mills are willing to make slight concessions to secure orders involving considerable tonnage, thereby enabling them to build up a rolling schedule to which smaller orders may be added. In view of high costs, however, shading is regarded by the trade as a temporary condition and not as presaging a general decline from the Industrial Board level.

The Chicago, Milwaukee & St. Paul is inquiring for 200 tons of tank plates for first quarter shipment.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.78c. for plates out of stock.

Cast Iron Pipe.—The National Cast Iron Pipe Co. is low bidder on 4200 tons of 6 to 12-in. for Detroit and 290 tons for St. Paul. Detroit will also close on 4800 tons of larger pipe to-day. An increasing amount of municipal work is said to be in prospect, as a result of the recent sharp drop in prices.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., \$69.10; 6-in. and above, \$64.10; class A and gas pipe, \$4 extra.

Bolts and Nuts.—The stopping of shipments on all unfilled orders by the Ford Motor Co. had a depressing effect on the trade, particularly because that company had just issued several attractive inquiries. Market activity is at a low ebb and shading of prices by bolt and nut manufacturers is becoming increasingly general. Production is on a diminishing scale, but one plant which was idle for a week is again operating at about 50 per cent of capacity. For manufacturers' prices, see finished iron and steel, f.o.b. Pittsburgh, page 167.

Jobbers quote structural rivets, 5.08c.; boiler rivets, 5.18c.; machine bolts up to $\frac{3}{4}$ x 4 in., 40 per cent off; larger sizes, 30 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 25 off; larger sizes, 25 off; hot pressed nuts, square tapped and hexagon tapped, 35 off; blank nuts, 35 off; coach or lag screws, gimlet points, square heads, 45 per cent off. Quantity extras are unchanged.

Old Material.—The purchase of several thousand tons of open hearth steel by a local interest has halted the downward tendency of heavy melting and shoveling. Some small inquiries for cast scrap have been received from country foundries, but on the whole trading is so limited that quotations are to be regarded as largely nominal. A few grades are weaker in sentiment at least, although it is believed that present prices would quickly disappear if any buying developed. The Pennsylvania Southwestern system offers 5000 tons including 1100 tons of No. 1 wrought; the Pennsylvania Northwestern region offers a small list, the St. Paul 1800 tons, the Union Pacific 2000 tons, the Great Northern 2500 tons, the Wabash 600 tons, the Northern Pacific 1000 tons and the Pere Marquette 2000 tons.

Per Gross Ton

Iron rails	\$23.50 to \$24.00
Relaying rails	37.50 to 42.50
Car wheels	21.00 to 22.00
Steel rails, rerolling	15.50 to 16.00
Steel rails, less than 3 ft.	16.50 to 17.00
Heavy melting steel	15.00 to 15.50
Frgs. switches and guards, cut apart	15.00 to 15.50
Shoveling steel	15.00 to 15.50
Low phos. heavy melting steel	17.50 to 18.00
Drop forge flashings	12.00 to 12.50

Per Net Ton

Iron angles and splice bars	22.00 to 22.50
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	22.00 to 22.50
Iron car axles	32.50 to 33.00
Steel car axles	16.50 to 17.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.00 to 9.50
Cut forge	13.00 to 13.50
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	14.50 to 15.00
Coil springs	18.00 to 18.50
No. 1 cast	17.00 to 17.50
Low phos. punchings	15.50 to 16.00
Locomotive tires, smooth	11.50 to 12.50
Machine shop turnings	7.50 to 8.00
Cast borings	9.50 to 10.00
Stove plate	18.00 to 18.50
Grate bars	13.00 to 13.50
Brake shoes	11.00 to 11.50
Railroad malleable	14.50 to 15.00
Agricultural malleable	14.50 to 15.00
Country mixed	10.00 to 10.50

Sheets.—Local independent capacity is idle and it is reported that most Ohio independent mills have been shut down. The market is not devoid of inquiry, but the tonnages involved are usually so small that they would not justify a resumption of operation. The failure of the Ford Motor Co. to resume operations on Jan. 3, as was expected, and the subsequent action of that company in stopping shipment on all undelivered orders, whether for steel or for casings and machinery,

proved a blow to the trade. A considerable tonnage of sheets and bars was on order for January rolling.

Mill quotations are 4.35c. for No. 28 black; 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 4.68c.; No. 28 black, 5.73c. to 6c.; No. 28 galvanized, 7.35c.

Wire Products.—Although there has been a slight improvement in sentiment, the market is still dull. The open winter has caused some jobbers to ask for hurry up shipments on nails, but on the whole consumers are cautious. The leading interest is on a normal operating basis with considerable work ahead. Its December shipments were heavy. The mill of the local independent is down for repairs. Chicago jobbers have reduced the base price on cement coated nails from 4c. to 3.75c. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 167.

Cincinnati

CINCINNATI, Jan. 11.

Pig Iron.—The belief expressed last week that the market would gradually pick up has not been borne out by developments, as inquiry is still very light and carload transactions continue the chief activity. The biggest sale reported during the week was 600 tons of Northern resale iron, silicon 2.25 to 2.75, to a central Ohio melter, at a price which would figure approximately \$31, furnace. It is expected that an inquiry for 500 tons of malleable iron for a Detroit melter will be closed this week. A local selling agency reports an inquiry received by a New York office for 10,000 tons of low silicon iron, supposedly for shipment to an Ohio plant. Prices continue their downward trend, Jackson County silvery makers cutting from \$55 to \$48.50, furnace, for 8 per cent. In the South almost all furnaces with iron to sell have indicated their willingness to take orders at \$35 base, and it is reported that one Tennessee furnace is quoting \$32 for prompt shipment from its yard stock. A Detroit furnace is offering a considerable tonnage at \$33.25 furnace base, with the customary differentials for higher silicon. Furnaces in southern Ohio have a price of \$35, Iron-ton, but it is believed that \$33 could be done on a fair-sized tonnage. The basic market has definitely settled to \$30, and it is reported that a considerable tonnage is under negotiation. One of the stacks of the American Rolling Mill Co. at Columbus was banked last week.

Based on freight rates of \$4.50 from Birmingham and \$2.52 from Iron-ton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	\$36.50 to \$39.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	37.75 to 40.75
Ohio silvery, 8 per cent sil.	47.52
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	33.52 to 35.52
Basic northern	32.52
Malleable (nominal)	33.52 to 36.02

Finished Iron and Steel.—There is very little activity in the finished line, though some sales of carload lots are reported. A report has been current that plates had been offered in the Cincinnati market at prices lower than 2.65c., but the rumor apparently has no foundation. While buying has been light, there have been some inquiries, and it is expected that these will develop into orders within a short time. According to all reports, stocks in manufacturers' hands are very low, and as soon as there are signs of a revival in business, it is expected that metal working plants will be in the market for their needs for several months. At the present time, buying is of the hand to mouth variety. The structural market is very dull, the only award being several hundred tons for the fourth unit of the power house of the Union Gas & Electric Co. This went to the American Bridge Co. It is reported that the company having the erection of the new Lunkenheimer foundry at Hartwell Junction, has decided to relinquish its contract, owing to internal trouble developing among some of the union men on the job. It is expected that bids will be asked for the erection of the building. A number of other building projects are in the process of development at the present time,

and will likely take definite shape before spring. Posting of plans for a new theater in Walnut Hills has been postponed indefinitely, though there are prospects of its going ahead if labor conditions become more stable.

Tool Steel.—The demand for tool steel has fallen to almost negligible proportions. Many plants still have some of their steel purchased during the war period, and are working this off before buying more. Prices remain at the old levels, 18 per cent tungsten high speed steel being quoted at \$1.20 per lb.

Warehouse Business.—Local warehouses report business very quiet. Orders for small lots, however, are being received from day to day, and the situation is a little brighter since the turn of the year. There is a fair demand for nails, and bolts and rivets are also fairly active. Warehouse stocks are in good shape to take care of all demands, though in the steel pipe line stocks are more or less broken. Better mill shipments, however, will take care of this deficiency within a short time. Prices remain unchanged.

Iron and steel bars, 3.58c. base; shapes, 3.68c. base; hoops and bands, 3/16 in. and lighter, 4.28c.; plates, 3.88c. base; reinforcing bars, 3.65c.; cold-rolled rounds, 1 1/2 in. and over, 5.20c.; under 1 1/2 in. rounds, flats, squares and hexagons, 5.70c.; No. 10 blue annealed sheets, 4.78c. base; 28-gage black sheets, 6c. base; 28-gage galvanized sheets, 7c. base; wire nails, \$4 per keg, base.

Coke.—The coke market is very quiet and prices are unchanged. Prompt shipment Connellsville furnace coke is offered at \$5.50, and foundry at \$7. On contract coke, \$7.50 and \$8.50 respectively are the general asking prices. Wise County furnace coke is quoted at \$7 and foundry at \$9. Sales of New River foundry have been made at \$12.50.

Old Material.—The scrap market is stagnant. There is practically nothing moving, and prices quoted below can scarcely be regarded as anything more than nominal.

We quote dealers' buying prices:

	Per Gross Ton
Bundled sheets	\$7.50 to \$8.50
Old iron rails	16.50 to 17.50
Relaying rails, 50 lb. and up	45.50 to 46.50
Re-rolling steel rails	12.50 to 13.50
Heavy melting steel	12.50 to 13.50
Steel rails for melting	12.50 to 13.50
Car wheels	19.50 to 20.50

	Per Net Ton
No. 1 railroad wrought	11.50 to 12.50
Cast borings	6.50 to 7.00
Steel turnings	4.00 to 4.50
Railroad cast	16.50 to 17.50
No. 1 machinery	18.50 to 19.50
Burnt scrap	8.50 to 9.50
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	11.00 to 12.00
Pipes and flues	7.50 to 8.00
Malleable cast	10.50 to 11.00
Railroad tank and sheet	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., Jan. 11.

Stocks on Alabama furnace yards, on Jan. 1 amounted to 133,000 tons compared with 100,000 tons Dec. 1. There were 113,000 tons of foundry compared with 90,000 on Dec. 1. No warrants compared with 100 tons and 15,000 of basic compared with 8,000 tons Dec. 1.

Pig Iron.—Most pronounced buying that had taken place in the Birmingham iron market for many weeks was that following the official announcement of the Alabama Co. the latter part of last week of its being on a \$35 base. This rate was quoted numbers of consumers whose inquiries had been held up pending decision as to the new rate. There was a prompt response from a wide range of territory and more than 2,000 tons in lots of 50 to 100, 200 and 500-ton lots were booked in a day or so. This lead was followed by another maker, who sold several small lots. The bigger business done by the Alabama Co. was due to more vigor in going out after it. One of the largest foundry producers declined to be wrought up over the new price, saying: "I will continue to quote \$38, knowing that, of course, it will be nominal, until there is a sign of real business. Then I shall consider whatsoever level real business may be done on." The Alabama Co.

and one other maker reported several additional sales of small lots of pig iron at \$35 Monday and several live inquiries, but no pipe shops have yet shown any interest.

We quote per gross ton f.o.b. Birmingham district furnace, the Tennessee company included, as follows:

Foundry, sil. 1.75 to 2.25	\$35.00
Basic	34.00
Charcoal	50.00

Finished Material.—Agents of Northern independent steel producers report the first week in January as the best in a long time. Total bookings for their Southern trade were not large, but much larger than in the past. The inquiry is also brisker, indicating desire to do business. Bars, sheets and pipe have been most active, one sale being that of 95,000 feet of dry kiln steel pipe. Southern independent steel mills have resumed in wire drawing departments with a fair demand for nails and wire, especially nails, but are not on more than 40 per cent turn. Each day, however, adds to their better prospect because the Southern farmer is close to the beginning of another crop season and must replenish his stock of steel implements entering into agricultural operations. Hoop and tie mills have not yet resumed. Tie stocks are not more than usual.

Cast Iron Pipe.—Cast iron pipe plants, water and gas and sanitary, are slow in resuming and new business is slower still. One Gadsden sanitary shop resumed Monday simultaneous with a 25 per cent wage cut. Pipe that is manufactured now is going into stock. The Stockham Pipe & Fittings Co., Birmingham, has incorporated in Illinois with a capital stock of \$500,000, taking this step incident to a large warehouse and distributing business done in sanitary pipe with Chicago as base. Supreme effort is being made for realignment of export rates on pipe with chances of success, the railroads having invited conference looking to that end. The very large export pipe business done in 1920 was booked prior to export rate disintegration and there has been a dearth of new business.

Coal and Coke.—Coal is much softer owing to the large production compared with industrial slow-down and ranges now from \$2.50 f.o.b. mine and up. The mine strike is in statu quo.

Old Material.—The scrap market could not be much weaker than it is. Steel works have not given orders for prompt movement, but incline to have old material held back.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	\$17.00 to \$18.00
No. 1 heavy steel	16.00 to 17.00
No. 1 cast	23.00 to 24.00
Car wheels	23.00 to 24.00
Tramcar wheels	22.00 to 23.00
No. 1 wrought	18.00 to 20.00
Stove plate	14.00 to 15.00
Cast iron borings	7.00 to 8.00
Machine shop turnings	7.00 to 8.00

Buffalo

BUFFALO, Jan. 11.

Pig Iron.—Business continued dull during the week with one exception. One local producer records a sale of 2,000 tons of basic at \$35 for delivery over the next three months. This is by all odds the largest transaction in this district in months. Inquiries are also said to have improved. A fair tonnage of foundry iron was resold at \$30, furnace, for No. 2 plain. One producer sold 50 tons of No. 2X foundry at \$36.25. This was straight furnace iron. Another producer sold 150 to 200 tons of foundry at a base price of \$34. Some of this was No. 2X at \$35.25. Though this furnace has not posted its official schedule at \$34 for No. 2 foundry, it is offering any tonnage at this figure. Two other producers are maintaining an "official" price of \$35 for the base grade, though one of these has been taking and did take last week a carload of resale at \$34.

We quote f.o.b. Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	\$33.00 to \$37.00
No. 2X foundry, 2.25 to 2.75 sil.	31.25 to 35.25
No. 2 plain, 1.75 to 2.25 sil.	30.00 to 34.00
Basic	35.00
Malleable	36.25

Warehouse Business.—There have been some further price reductions in the local field, effective Jan. 5. The market is quiet with a small amount of selling.

We quote prices f.o.b. Buffalo as follows: Structural shapes, 3.60c.; plates, 3.80c.; plates, No. 8 gage, 4.85c.; soft steel bars and shapes, 3.50c.; hoops, 4.60c.; blue annealed sheets, No. 10 gage, 4.90c.; galvanized steel sheets, No. 28 gage, 7.35c.; black sheets, No. 28 gage, 6c.

Finished Iron and Steel.—Business remains very quiet in this market. Generally speaking it is even more quiet than during this time in December, though this is not the unanimous opinion. There is practically no selling, though one maker reports a slight improvement in inquiry. The local mill interest which had expected to start all its mills this month has postponed the time until early next month, but there is a general feeling in this mill that the mills will actually start,—a feeling of more confidence than there was in December that the mills would start in January. This interest expects to start four or five mills early next month, including two blooming mills which will start first and prepare material. A structural mill and a plate mill will also resume rolling in February. The bar mills will resume rolling later. A local rail mill has picked up considerable miscellaneous business and will roll steadily at high production throughout the first quarter. This mill has been rolling rails steadily throughout November and December. Another mill interest expects to start a bar mill early in February.

Old Material.—The market has improved somewhat. Mills, while not actively seeking tonnage, are willing to pick up lots at their own price. They will pay \$15 to \$16 for heavy melting steel and a local mill did buy a tonnage during the week at \$15. A railroad list closed last week at \$16 for heavy melting. There is no activity in other grades.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel.....	\$15.00 to \$16.00
Hydraulic compressed	14.00 to 15.00
Low phos., 0.04 and under.....	25.00 to 26.00
No. 1 railroad wrought.....	22.00 to 23.00
No. 1 machinery cast.....	26.00 to 27.00
Iron and steel axles.....	30.00
Car wheels	24.00 to 25.00
Railroad malleable	18.00 to 19.00
Machine shop turnings.....	11.00 to 12.00
Heavy axle turnings.....	15.00 to 16.00
Clean cast borings.....	12.00 to 13.00
Iron rails	25.00 to 26.00
Locomotive grate bars.....	15.00 to 16.00
Stove plate	17.00 to 18.00
Wrought pipe	14.00 to 15.00
No. 1 busheling.....	14.00 to 15.00
Bundled sheet stampings.....	10.00 to 11.00

New York

NEW YORK, Jan. 11.

Pig Iron.—The market in the East seems to be settling to a basis of \$30, furnace, for No. 2 foundry, but even that quotation has not developed much business. Brokers who have had opportunity to buy resale iron at very low prices are hesitating and some of them who have sent out a large number of letters to possible customers have received very little encouragement, the almost invariable answer being that the persons addressed are not interested. Reports of a sale of 10,000 tons to a cast iron pipe company are not confirmed.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$5.46 from Buffalo and \$6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.....	\$36.52 to \$37.52
East. Pa., No. 2X fdy., sil. 2.25 to 2.75.....	34.77 to 35.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	33.52 to 34.52
Buffalo, sil. 1.75 to 2.25.....	36.16 to 38.16
No. 2 Virginia, sil. 1.75 to 2.25.....	40.16 to 42.16

Ferroalloys.—There is no demand for ferromanganese, which is quoted nominally at \$10, seaboard, for the British alloy with the understanding that American producers would meet this level on a firm offer. Very little is heard of resale alloy, an offer of \$98 for which did not bring out any business. The spiegeleisen market is also lifeless with the quotation nominal at around \$45, furnace. Manganese ore is also hard to sell, the nominal quotation for this being 40c. to 45c. per unit,

seaboard. Producers of 50 per cent ferrosilicon are asking \$95 per ton, delivered. It is understood, however, that a sale was made in the past week at considerably below this level.

Warehouse Business.—Although buying is slack, some optimism is felt owing to the number of inquiries being received. The present lack of buying is partly attributed to the strike of architectural iron workers in force since Jan. 1. There are some complaints of difficulty in obtaining early shipments from mills unless the order is for a large tonnage. Prices of wrought steel pipe having been reduced by mills to the March 21, 1919, schedule maintained by the Steel Corporation, warehouse prices have dropped about \$10 per ton. While we quote 7.35c. per lb. for No. 28 gage galvanized sheets, a fair-sized order would probably bring out a price of about 7c. per lb. On tin plates also, a fair-sized order would probably produce a slightly better quotation. We quote prices on page 182.

High Speed Steel.—A nominal price of \$1.25 per lb. for 18 per cent tungsten is generally quoted. Some inquiry is noted from automobile manufacturers and widely diverse lines, although sales are few and small.

Finished Iron and Steel.—There is little to indicate any definite trend toward improvement in the demand for steel products. A few more inquiries have come out in the past ten days, and some small orders have been placed. Eastern plate mills are still trying to get enough tonnage on their books to resume operations. One steel company booked 900 tons of concrete reinforcing bars and added to these a number of small orders so that it could start its bar mills, which had been idle for some weeks. In structural material there is no change, the past week having been rather dull. Among current inquiries are the following: 200 tons for two bridges for the Pennsylvania Railroad; 200 tons for the Connecticut State Armory; 500 tons for a building for the Mutual Chemical Co., Cedar Creek, Va. A building for the Federal Chemical Co., Columbus, Ohio, requiring 400 tons, has been let to an unnamed fabricator. The Shoemaker-Satterthwait Bridge Co. was awarded a 100-ton bridge for the Philadelphia & Reading Railroad. The American Bridge Co. was low bidder on a crane runway for the Brooklyn Navy Yard, 770 tons, but the award has not been made. It is apparently correct that sales of sheets and tin plate have been made at prices below those of the Industrial Board schedule, but when such transactions have been traced it was found that the material sold was export tonnage, liquidation of which had been forced by the banks. Concessions on sheets of about \$3 a ton are reported to have been granted. A corresponding reduction was made on tin plate. The only new inquiry for cars comes from the Louisville & Nashville, which asks for bids on 2000 40-ton box cars, 300 55-ton gondola cars, 300 40-ton coke cars and 100 38-ft. livestock cars. Some of the railroads have informally inquired of car builders whether they are willing to give protection to the railroads in the event of a further reduction in the prices of steel products. Other roads are placing orders, as for cars building in their own shops, only as need for material arises, showing no concern in respect to securing what they want when they need it.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.73c.; plates, 3.03c.; shapes, 2.83c.; bar iron, flats, wider than 6 in., 3.88c., with half extras; light rounds, squares and flats, 4.39c., with full extras, and other sizes, 3.38c., with half extras.

Cast Iron Pipe.—Present business remains very dull, though instinct tells veteran manufacturers that prospects are slightly better. More tentative inquiries have been received from private companies. The failure of pig iron to settle at a stable price is generally given as the chief reason for the stagnation in the pipe trade. We quote f.o.b., New York, as follows: 6-in. and larger, \$63.30; 4-in., \$73.30; 3-in., \$83.30, with \$4 additional for Class A and gas pipe.

Old Material.—The fact that price reductions the past three weeks have been so slight has evidently persuaded many dealers that the bottom has been prac-

tically reached. Accordingly they are buying and storing in their yards for the rise which is expected. A few price declines are noted this week, none of which is over \$1. It is the belief that mills will find it very difficult to secure large tonnages at existing prices.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	\$10.00 to \$10.50
Rerolling rails	13.50 to 14.00
Relaying rails, nominal.....	48.00 to 50.00
Steel car axles	16.00 to 17.00
Iron car axles.....	32.00 to 33.00
No. 1 railroad wrought.....	16.00 to 17.00
Wrought iron track.....	10.00 to 10.50
Forge fire	9.00 to 9.50
No. 1 yard wrought long.....	13.00 to 14.00
Light iron	5.00 to 6.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	8.50 to 9.00
Mixed borings and turnings.....	7.00 to 7.50
Iron and steel pipe (1 in. diam. not under 2 ft. long).....	10.00 to 11.00
Stove plate	15.00 to 16.00
Locomotive grate bars	13.00 to 14.00
Malleable cast (railroad).....	13.00 to 14.00
Old car wheels.....	22.00 to 23.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast.....	\$24.00 to \$25.00
No. 1 heavy cast (columns, building materials, etc.) cupola size.....	24.00 to 25.00
No. 1 heavy cast, not cupola size....	13.00 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	15.00 to 16.00

Boston

BOSTON, Jan. 11.

Pig Iron.—Resale iron has continued to move slowly since last reports, total sales for the week approximating a dozen cars. Prices on Buffalo iron are perhaps a shade easier, 200 tons No. 2 X having sold at \$31 furnace, or about \$1 lower than the previously reported low price. Two cars of eastern Pennsylvania No. 2 X sold at \$36.50 delivered, which brings the base price at furnace down to about \$31. This price was accepted because some doubt as to the iron containing silicon 2.25 to 2.75 existed. Most local pig iron interests report an increase in real inquiries during the past few days and more activity in the market is anticipated within the near future. Additional contracts for castings have been accepted by foundries at price reductions ranging from 1c. to 3c. per lb. Delivered prices on resale iron follow:

East. Penn., sil. 2.25 to 2.75.....	\$40.31 to \$43.31
East. Penn., sil. 1.75 to 2.25.....	39.06 to 42.06
Buffalo, sil. 2.25 to 2.75.....	36.71 to 39.71
Buffalo, sil. 1.75 to 2.25.....	36.46 to 38.46
Virginia, sil. 2.25 to 2.75.....	39.58 to 41.83
Virginia, sil. 1.75 to 2.25.....	38.33 to 40.58
Alabama, sil. 2.25 to 2.75.....	47.91 to 49.91
Alabama, sil. 1.75 to 2.25.....	46.66 to 48.66

Finished Material.—Mill representatives report a slight improvement in prospective business. Moderate tonnages of boiler plates, small bars and sheets for stocking purposes have been booked since last reports, mostly in 300 ton lots and smaller. Bids were opened Jan. 5 at the Fore River Works, Quincy, Mass., Bethlehem Ship Building Corporation, Ltd., on 256 class B boiler plates, about 400 tons, including shell plates 196-in. and 195½-in. wide and 2 3/32-in. and ¼-in. thick. Two firms bid 2.65c. f.o.b. Pittsburgh subject to the word "width" in the specifications being changed to read "length," and the Lukens Steel Co. bid the same price without reservations. Prospects include 1000 tons 85-lb. T rails, 300 tons heavy boiler plates, 800 to 900 tons concrete bars for Springfield, Mass., and 300 tons for a Boston bridge, an aggregate of about 2000 tons commercial bars, about six cars boiler tubes, one 600 ton, one 500 ton, and one 200 ton and one 100 ton structural lots. The American Bridge Co., Boston, has the structural steel for the Portsmouth, N. H. Kittery, Me., bridge. Lower pipe schedules have failed to bring out inquiries.

Warehouse Business.—Although the market is by no means active, warehouse interests report slightly more activity in iron and steel. All of the leading firms which have been quoting cold rolled flats at 9½c. per lb. base have reduced the price to 6c., thereby placing them on the same basis as squares and hexagons. Cold rolled rounds remain at 5½c. per lb. base. Jobbers have reduced prices on Eagle carriage bolts and on common

tire bolts, the former now being 60 per cent discount, and the latter 40 per cent. The market on wire nails is lower due to increased shipments from New England and Pittsburgh mills. They are now \$4.35 per keg base from store, f.o.b. Boston, and \$3.60 per keg base in mill shipments of less than car lots, f.o.b. Pittsburgh.

Jobbers now quote: Soft steel bars, \$3.70 per 100 lb. base; flats, \$4.50 to \$4.85; concrete bars, \$4 to \$4.25; tire steel, \$5 to \$5.50; spring steel, open hearth, \$8.50; crucible, \$14; steel bands, \$4.65 to \$6.25; steel hoops, \$6; toe calk steel, \$7; cold rolled steel, \$5.50 to \$6; structural, \$3.70 to \$5.50; plates, \$4 to \$4.40; No. 10 blue annealed sheets, \$5.90; No. 28 black sheets, \$8.15; No. 28 galvanized sheets, \$9.50; refined iron, \$4.65 to \$5.65; best refined, \$5.50; Wayne, \$8.50; band iron, \$4.65; hoop iron, \$6; Norway, \$15.

Coke.—Sales of coke during the past week have been scattered, but covered a wider range of product. For instance, there have been sales of New England Coal & Coke Co. product at \$16.70 delivered where the freight rate does not exceed \$3.40, or a \$10.50 Connellsville base; sales of Providence Gas Co. product on a \$10 Connellsville base; sales of Connellsville at \$13.20 delivered or a \$7 Connellsville base; and sales of other foundry coke at around \$12.50 delivered or a \$7.50 Connellsville base. Several large New England consumers are still uncovered on their first half foundry coke requirements.

Old Material.—The market is very largely a dealers' affair, foundries and mills showing almost no interest in old material. Prices on several classifications are lower as a result. Dealers have purchased small tonnages of blast furnace borings and turnings at \$6 f.o.b. Boston, machine shop turnings at \$8, heavy melting steel at \$9 and wrought pipe at \$10, largely on speculation, the material going into stock. The top price on machinery cast reported this week is \$27 delivered, one car being sold to a foundry at that price. Dealers will not pay much more than \$24 shipping point. The available supply is small, however, and any real buying might lift prices. There is a slight inquiry for axle turnings. Little is available, the chief source of supply operating but three days a week. One car sold direct to consumer at \$14.50 delivered, a price above the general quotation. Local yard prices on old materials follow:

No. 1 heavy melting steel.....	\$9.00 to \$9.50
No. 1 railroad wrought.....	18.00 to 19.00
No. 1 yard wrought.....	16.00 to 17.00
Wrought pipe (1-in. in diameter, over 2 ft. long).....	9.50 to 10.50
Machine shop turnings.....	8.50 to 9.00
Cast iron borings, rolling mill.....	8.50 to 9.50
Cast iron borings, chemical.....	10.00 to 11.00
Heavy axle turnings.....	9.00 to 9.50
Blast furnace borings and turnings..	6.00 to 6.50
Forged scrap	7.00 to 8.00
Bundled skeleton	7.00 to 8.00
Street car axles, steel.....	18.00 to 19.00
Car wheels	29.00 to 30.00
Machinery cast	24.00 to 26.00
No. 2 cast.....	22.00 to 23.00
Stove plate	17.00 to 18.00
Railroad malleable	16.00 to 16.50
Rerolling rails	13.00 to 14.00

St. Louis

ST. LOUIS, Jan. 11.

Pig Iron.—No activity has developed as yet in the pig iron market, as the melters are in need of no metal save in some special instances where car lots have been bought to meet special requirements. Most of them have large quantities on the yard or under contract and are willing to let go of surplus supplies at a sacrifice, but there is no demand even for bargain lots. The prices quoted generally are \$35 furnace for No. 2 Southern, Birmingham basis, and the same figure for No. 2 Northern at Chicago. No prices are being made on basic and none is wanted at present. Resale iron is present in the market as it has been for some time.

Coke.—Coke is available at \$7.50 Connellsville, for best selected 72 hour, for prompt shipment with contracts for the first half put at \$8 to \$10, but with no contracts being made. No new developments are reported in the by-product coke situation.

Finished Iron and Steel.—In finished products there has been no change as yet from the previous reports, as the readjustment period is not yet over as between

the mills and their customers with contracts. We quote stock out of warehouse as follows:

Soft steel bars, 3.57½c.; iron bars, 3.57½c.; structural material, 3.67½c.; tank plates, 3.87½c.; No. 10 blue annealed sheets, 4.77½c.; No. 28 black sheets, cold-rolled, one pass, 6.10c.; No. 28 galvanized sheets, black sheet gage, 7.45c.

Old Material.—The scrap market is somewhat improved in tone and tendency, but the prices quoted continue low, as the transactions so far are small and are chiefly among the dealers. Consumers are not yet entering the market, despite the fact that quotations are regarded as likely to increase from now on, even though it be but slowly. The railroad lists out during the week include the St. Louis and San Francisco, 650 tons; Missouri, Kansas & Texas, 1100 tons; Pennsylvania, 5200 tons; Wabash, 1200 tons; Mobile & Ohio, 800 tons; while the Missouri Pacific, Iron Mountain, Cotton Belt and Terminal Association have been selling lots without issuing formal lists.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$20.50 to \$21.00
Old steel rails, rerolling	17.00 to 17.50
Old steel rails, less than 3 ft.	15.00 to 15.50
Relaying rails, standard section, subject to inspection	35.00 to 40.00
Old car wheels	30.00 to 30.50
No. 1 railroad heavy melting steel scrap	14.00 to 14.50
Heavy shoveling steel	13.00 to 13.50
Ordinary shoveling steel	12.50 to 13.00
Frogs, switches and guards cut apart	14.00 to 14.50
Per Net Ton	
Ordinary bundled sheet	6.00 to 6.50
Heavy axle and tire turnings	7.00 to 7.50
Iron angle bars	22.00 to 22.50
Steel angle bars	13.00 to 13.50
Iron car axles	29.00 to 29.50
Steel car axles	18.00 to 18.50
Wrought arch bars and transoms	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.00 to 13.50
Railroad springs	12.50 to 13.00
Steel couplers and knuckles	12.50 to 13.00
Locomotive tires, 42 inches and over, smooth inside	10.00 to 10.50
No. 1 dealers' forge	9.00 to 9.50
Cast iron borings	7.50 to 8.00
No. 1 busheling	13.00 to 13.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast scrap	17.00 to 17.50
Stove plate and light cast scrap	14.00 to 14.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	10.50 to 11.00
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	5.00 to 5.50
Country mixed scrap	9.00 to 9.50
Uncut railroad mixed scrap	9.50 to 10.00
Horseshoes	16.50 to 17.00
Railroad brake shoes	12.00 to 12.50

Cleveland

CLEVELAND, Jan. 11.

Iron Ore.—There has been a further curtailment of mining operations in the Lake Superior district since the first of the year, due to reducing operations to one shift in a number of the mines. No further reductions of miners' wages are reported, but it is expected that reductions will be generally made by independents a little later. While there was more ore on lake docks Dec. 1 than ever before on that date, the movement from the docks during December was sufficient to cut the dock balance on Jan. 1 to less than it was a year ago at that time. Ore shipments from Lake Erie docks during December were 1,251,315 gross tons, as compared with 638,080 tons during December, 1919. The balance on docks Jan. 1 was 9,927,317 tons, as compared with 10,090,708 tons a year ago. Very little ore is moving from docks at present and it is expected that January shipments will fall far below those in December.

We quote delivered lower lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesaba Bessemer, \$7.20; Mesaba non-Bessemer, \$6.55.

Pig Iron.—There is a slight improvement in the demand for small lots of iron for early shipment, mostly in foundry grades, but producers look for only a limited amount of business of this character, as there are few foundries in this territory that do not have iron due on old contracts. There have been very few

releases of shipments on suspended iron since the first of the year, indicating that there is little change in the general situation respecting foundry operations. Prices on foundry iron are somewhat irregular. The Valley price of No. 2 has settled down to \$32.75 to \$33, but Cleveland furnaces are still asking \$34 and another lake furnace is quoting \$35 for this grade. However, these are expected to meet the lower Valley price. Most of the limited demand is being supplied with resale iron which is still to be had at \$30 Valley furnace for No. 2, although some is being offered at \$31 and \$32. Resale malleable iron is to be had at somewhat below the usual furnace price of \$32 for this grade. We note the sale of 100 tons of malleable iron to a Canton, Ohio, foundry and several carlot sales of foundry iron, the latter at \$33 to \$35. Inquiries include one from Columbus for 500 to 1000 tons of malleable iron and one from Springfield for 600 tons of foundry iron, both for the first half. A northern Ohio consumer is asking for 100 tons of low phosphorous iron and 100 tons of Bessemer iron for prompt shipment. Jackson County furnaces have reduced prices \$6.50 per ton on silvery iron and Bessemer ferrosilicon.

We quote delivered Cleveland as follows, based on the new freight rates, these being a 56c. switching charge for local iron, a \$1.96 freight rate from Valley points, a \$3.36 rate from Jackson and \$6.67 from Birmingham:

Basic	\$34.96
Northern No. 2 fdy., sil. 1.75 to 2.25	\$31.96 to 34.56
Southern fdy., sil. 2.25 to 2.75	41.92 to 42.92
Ohio silvery, sil. 8 per cent.	51.86
Standard low phos., Valley furnace	45.00

Coke.—A very limited amount of business in prompt shipment foundry coke is being booked at a range of \$7 to \$7.50 for standard Connellsville makes. There is no demand for first half contracts.

Bolts, Nuts and Rivets.—A better volume of inquiry for bolts and nuts has developed since the first of the year, makers having received inquiries from railroads and other consumers for contracts for their first quarter requirements. It is expected that enough business will develop during the next two or three weeks to determine whether present prices will hold. The demand for rivets continues very light, but some inquiries are coming out for first quarter requirements. Bolt manufacturers are now quoting a \$4 a ton differential between large and small track bolts, these bolts in small sizes being quoted at 7.50c. Makers of cap and set screws have made another sharp cut in prices.

Semi-finished Steel.—There is no demand for semi-finished steel and considerable difference of opinion prevails as to the price situation. One local consumer seems satisfied that on a round tonnage inquiry a quotation on slabs of \$40 a ton or lower would come out.

Finished Iron and Steel.—That the demand for finished steel has improved a little since the holidays is indicated by reports of some of the mills that are getting a few inquiries for car lots or less in steel bars, plates and structural material. Other mills notice no change in the situation. Evidently the feeling among some buyers is more optimistic than a month ago, and they are inclined to place small orders. The Otis Steel Co. is operating its Riverside plant at increased capacity this week, but with this exception plant operations have not changed in this territory. Prices apparently are being maintained on all finished lines except plates. Sellers who are quoting the regular prices on plates report that they are losing business because of lower prices and these reports indicate that plates have sold as low as 2.45c., although positive confirmation is lacking. The only price change reported this week is a reduction to 3.25c. on nails by the Cambria Steel Co. There is little change in the operation of industrial plants as compared with the pre-holiday period, and many consumers still have good stocks of steel. More activity is developing in the building field and in this field the first real revival is expected in the demand for steel. The general contract for the Federal Reserve Bank of Cleveland has been awarded to John Gill & Son, and it is expected that bids for the steel, approximately 6000 tons, will be called for in 30 days. The David Lupton Sons Co. has placed 200 tons with the Massillon Bridge & Structural Co. for a Cleveland warehouse. The Standard Oil Co. will do its own

fabrication on 300 tons for a building in Toledo and a coal handling plant taken by a Cleveland manufacturer will require 300 tons of steel. Competition among bidders is resulting in very low prices for fabricated work. The demand for hard steel reinforcing bars is insufficient to keep all rerolling mills in operation and on these bars 2.35c. is generally quoted. The Cambria Steel Co. has taken 3000 tons of rails for the Ann Arbor Railroad and 1000 tons for the Toledo Terminals Railway. All railroad buyers in this territory have now covered for their 1921 requirements.

Cleveland warehouses quote steel bars at 3.30c. to 3.34c.; plates, 3.60c. to 3.64c. and structural material, 3.40c. to 3.44c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 4c.; No. 28 black sheets, 5.75c. to 5.90c.; No. 28 galvanized, 7.25c.; No. 10 blue annealed, 5c.

Sheets.—A little better demand for sheets is reported on orders to be shipped from stock, but regular prices are being maintained on mill orders.

Old Material.—There is practically no activity in the scrap market except in turnings. Local blast furnaces are still taking turnings and there have been some transactions in this grade between dealers, but orders for turnings will soon be all cleaned up. Mills are accepting no shipments of steel making scrap. The market is weak and there have been further declines on a number of grades.

Dealers quote delivered at consumers' yards in Cleveland and vicinity, as follows:

Per Gross Ton	
Heavy melting steel	\$14.00 to \$14.75
Steel rails, under 3 ft.	17.00 to 17.50
Steel rails, rerolling	17.00 to 18.00
Iron rails	17.00 to 17.50
Iron car axles	33.00 to 35.00
Low phos. melting scrap	16.50 to 17.00
Cast borings	11.50 to 12.50
Machine shop turnings	9.00 to 9.50
Mixed borings and short turnings ..	10.00 to 12.00
Short turnings for blast furnaces ..	10.00 to 12.00
Compressed steel	9.75 to 10.25
Railroad wrought	15.50 to 16.00
Railroad malleable	17.50 to 18.00
Steel axle turnings	11.75 to 12.50
Light bundled sheet stampings	6.00 to 7.00
Drop forge flashings over 10 in.	9.00 to 10.00
Drop forge flashings under 10 in.	9.00 to 10.00
No. 1 cast	21.00 to 22.50
No. 1 busheling	10.00 to 10.50
Railroad grate bars	15.50 to 16.00
Stove plate	15.50 to 16.00
Cast iron car wheels	20.00 to 21.00
Pipes and flues	9.00 to 10.00

Philadelphia

PHILADELPHIA, Jan. 11.

Pig Iron.—Further weakening in pig iron prices is in evidence. One lot of 500 tons of eastern Pennsylvania foundry iron analyzing 1.75 to 2.25 per cent silicon was sold at \$32, delivered, and it is intimated that a price close to \$30, furnace, could be obtained now on a desirable tonnage. A recent sale of 1000 tons of iron to a Virginia pipe foundry was at \$30, furnace, but a good deal of the iron was off grade. Some eastern Pennsylvania furnaces are quoting \$32.75 for No. 2 plain and \$34 for No. 2X iron, f.o.b. furnace, but buyers are interested only in a small way. Carload lots are the usual purchase. Virginia foundry iron has been offered as low as \$33, furnace, for No. 2 plain, this being standard analysis iron. A leading seller of low phosphorus iron, copper free, has quoted \$43, furnace, but has made no sales. On copper bearing low phosphorus iron, the nominal quotation is \$40, furnace. Gray forge iron is obtainable at \$30, eastern Pennsylvania furnace.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa. No. 2 plain, 1.75 to 2.25 ..	\$32.00 to \$34.15
East. Pa. No. 2X, 2.25 to 2.75 sil.	33.25 to 35.40
Virginia No. 2 plain, 1.75 to 2.25 sil.	38.74 to 40.74
Virginia No. 2X, 2.25 to 2.75 sil.	39.99 to 41.99
Basic deliv. Eastern Pa.	33.86
Gray forge	31.40 to 33.40
Standard low phos. (f.o.b. furnace) ..	43.00
Malleable (nominal)	37.00
Copper bearing low phos. (f.o.b. furnace) ..	40.00

Ferroalloys.—Ferromanganese is quoted by importers and domestic makers at \$110, seaboard, with no buying. A few sales of resale ferromanganese have been made at prices ranging from \$90 to \$100. Spiegeleisen is not active.

Semi-finished Steel.—With no activity the price of open-hearth rerolling billets nominally remains at \$49.24, Philadelphia.

Finished Steel.—Business continues very dull in finished steel lines and there is no prospect of resumption of work at Eastern mills in the very near future. The opinion is becoming quite general among sellers that steel prices must work to lower levels before there will be any pronounced revival of interest among buyers. The principal inquiries before the local trade come from railroads. The Southern Railway is inquiring for steel for 60 locomotives, this being in addition to the car material mentioned last week, and the Louisville & Nashville is in the market for 36 locomotives. The plate mills are taking no business of consequence, while the orders which structural mills are receiving are mainly for small lots out of stock. Bars are likewise quiet. We quote plates at 2.65c., structural shapes at 2.45c. and bars at 2.35c., Pittsburgh, and while there are rumors that these prices have been shaded, there is no direct evidence to this effect.

Bar Iron.—Following a reduction in puddlers' wages, an Eastern bar iron rolling mill has reduced its price on bar iron from 3c. to 2.35c., Pittsburgh, but announces that it will take only a limited tonnage at the latter price. So far no other bar mill is reported to have met the reduction.

Warehouse Business.—The following are prices quoted by local warehouses on small lots from stock:

Soft steel bars and small shapes, 3.70c.; iron bars (except bands), 4c.; round edge iron, 4.10c.; round edge steel, iron finish, 1½ in. x ½ in., 4.00c.; round edge steel, planished, 4.75c.; tank steel plates, ¼-in. and heavier, 4.00c.; tank steel plates, 3/16-in., 4.40c.; blue annealed steel sheets, No. 10 gage, 4.90c.; light black steel sheets, No. 28 gage, 5.95c.; galvanized sheets, No. 28 gage, 7.50c.; square twisted and deformed steel bars, 3.90c.; structural shapes, 3.80c.; diamond pattern plates, 6.00c.; spring steel, 6.50c.; round cold-rolled steel, 5.35c.; squares and hexagons, cold-rolled steel, 5.85c.; steel hoops, No. 13 gage and lighter, 4.65c.; steel bands, No. 12 gage to 3/16-in. inclusive, 4.65c.; iron bands, 5c.; rails, 3.70c.; tool steel, 16.00c.; Norway iron, 12.00c.; toe steel, 6.00c.

Old Material.—Quotations on old material are nominal, as there is no business to test prices. Recent sales by the Pennsylvania Railroad were at prices practically identical with those published below. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$14.50 to \$15.00
Steel rails, rerolling	18.00 to 19.00
No. 1 low phos., heavy 0.04 and under ..	23.50 to 24.00
Car wheels	25.00 to 26.00
No. 1 railroad wrought	20.00 to 21.00
No. 1 yard wrought	16.00 to 18.00
No. 1 forge fire	13.00 to 13.50
Bundled skeleton	13.00 to 13.50
No. 1 busheling	15.00 to 16.00
No. 2 busheling	11.00 to 12.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	12.00 to 12.50
Machine-shop turnings (for rolling mill and steel works use)	13.00 to 13.50
Heavy axle turnings (or equivalent) ..	14.50 to 15.00
Cast borings (for rolling mills)	15.00 to 16.00
Cast borings (for chemical plants) ..	17.50 to 18.00
No. 1 cast	22.50 to 23.00
Railroad grate bars	17.00 to 18.00
Stove plate (for steel plant use)	17.00 to 18.00
Railroad malleable	16.00 to 17.00
Wrought iron and soft steel pipes and tubes (new specifications) ..	14.00 to 15.00
Iron car axles	30.00 to 31.00
Steel car axles	25.00 to 26.00

The Velick Scrap Iron & Machinery Co., Detroit and Cleveland, is distributing tables designed to make short cuts in price computations. A table of net and gross ton price equivalents appears on a blotter. Another kind of table, printed on the company's letter-head, tells "how to compute the cost of a given weight at a given price per gross ton." In the left-hand column is a list of prices per gross ton and immediately adjoining is a red ink column giving the decimal equivalents. For instance, a question may come up as follows: "At \$30.25 a gross ton what is the cost of 65,300 lb.?" Adjoining the figure, \$30.25, in the table is the decimal, 0.0135044, which, multiplied by 65,300, gives \$881.83.

Little Demand for Refractories

PITTSBURGH, Jan. 10.—No change is noted in prices of refractories and it is stated that until labor costs are lower present levels will be maintained. New bookings are extremely light, however, and it is possible that the appearance of new business will create enough competition among manufacturers to bring about lower prices regardless of costs. The market for Kentucky fire-clay brick is not especially strong at the moment and no sizable business is possible at much above \$45 for high duty brick. Occasional carloads are moved up to \$50, but such sales rarely exceed a carload. The amount of business upon the books of makers is very small and is running down so rapidly in the absence of new bookings of any consequence that there promises to be a pretty general suspension of plant activities in the next few weeks.

Although a great many blast furnaces are down, the amount of relining work in progress is limited, probably because of the uncertainty which exists in regard to future prices of pig iron. The various subsidiaries of the Steel Corporation are taking all shipments due them and the leading independent steel company in Pittsburgh also is specifying fairly freely. Generally, however, the steel manufacturers are holding up shipments, this being particularly true of those located in eastern and central Ohio, who devoted a good deal of their production to the automotive industry. Current plant operations are about 50 per cent of capacity, although one or two of the larger units are operating at 70 per cent or higher.

We quote per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	\$45.00 to \$55.00	\$40.00 to \$45.00
Ohio	42.00 to 50.00	35.00 to 40.00
Kentucky	45.00 to 50.00	40.00 to 45.00
Illinois	45.00 to 55.00	35.00 to 45.00
Missouri	55.00 to 60.00	40.00 to 50.00
Silica Brick:		
Pennsylvania		50.00 to 55.00
Chicago		60.00
Birmingham		50.00 to 55.00
Magnesite Brick:		
Standard size, per net ton.....		100.00
Chrome Brick:		
Standard size, per net ton.....		80.00 to 90.00
Bauxite Brick:		
55 per cent per net ton.....		50.00
75 per cent per net ton.....		90.00

New Standard Samples

The Bureau of Standards, Washington, announces that a new standard sample of electric steel No. 51, 1.2 per cent carbon and a new standard sample of cast bronze No. 52 (approximate composition: copper 88 per cent, tin 8 per cent, zinc 2 per cent, lead 1.5 per cent, antimony 0.15 per cent, iron 0.10 per cent and nickel 0.10 per cent) have recently been prepared and are now ready for distribution with provisional certificates.

Standard sample No. 23a, a renewal of the exhausted sample No. 23, Bessemer steel, 0.8 carbon has also been prepared and is now ready for distribution with a provisional certificate.

Cleveland Molders Strike

Molders employed at the malleable iron foundry of the Grabler Mfg. Co., Cleveland, about 125 in number, have struck, following an announcement by the company that its plant would hereafter be operated as an open shop, and also making a cut of 10 to 12 per cent in wages. Employees of three Cleveland brass foundries engaged in making plumbing brass goods have also gone on a strike because of the adoption of the open shop and reduction in pay. In the brass foundries, the wage reduction was made by increasing the day from eight to nine hours with no increase in the day rate.

The Reading Iron Co., Reading, Pa., posted notices Jan. 10 that a reduction in wages would be made in all its departments, effective next week. The new rates will be announced later. The Crane Iron Co., Catawauqua, Pa., announced a wage cut of 20 per cent., effective Jan. 16.

TRADE CHANGES

The Falcon Steel Co., New York, has leased space at 18 East Forty-first Street for local headquarters.

The Begley Mechanical Corporation, New York, has leased space at 34 Park Row for local executive offices.

The Steel Utilities Corporation, Ypsilanti, Mich., has absorbed the Crosman Stamping Co. and is increasing the capacity and efficiency of the plant.

The Dayton Steel Co., Dayton, Ohio, has changed its name to the Dayton Structural Steel Co. in order to more definitely indicate the nature of its business.

The U. T. Hungerford Brass & Copper Co., New York, has established a Monel Metal Department in charge of John J. Dillon, who for eight years has made a specialty of this metal and its products.

The name of the Mount Union Refractories Co., Mount Union, Pa., has been changed to the United States Refractories Corporation. The change was made to include the manufacture of fire clay refractories, which field the company recently entered with a new plant at Woodland, Pa.

Stockholders of the Mossberg Wrench Co., 25 Charles Street, Providence, R. I., have voted to change the name of the company to the Rhode Island Warp Stop Equipment Co. The company manufactures electrical warp stops for looms, countershafts and belt shifters, stamping tools and stampings and sheet metal parts.

The Whiting Foundry Equipment Co., Harvey, Ill., has changed its name to Whiting Corporation, increasing its authorized capital stock from \$700,000 to \$3,000,000. The Whiting Corporation remains under the same management and will continue the manufacture of cranes, foundry equipment and railway specialties as heretofore.

The Famous Mfg. Co., manufacturer of baling presses, East Chicago, Ind., has been reorganized with the following new officers: President, Hans C. Petersen; vice-president, Joseph Hartley, Sr.; treasurer, David Cohen; secretary, Willis E. Roe. Directors not holding office include C. E. Cann, W. A. Schroeder, and Henry W. Peterson.

Robert Grant, Woolworth Building, New York, has formed a chemical division under the supervision of J. P. Allen, formerly district sales manager of E. I. DuPont de Nemours & Co., and more recently manager of the chemical department of Marden, Orth & Hastings Co., Inc. D. H. Litter, many years director of purchases for the Calco Chemical Co., will associate himself with the operation of this chemical division in addition to his other duties as general manager. The new division will do an export and import business in general industrial chemicals and act as agent for American and foreign manufacturers for the sale and distribution of products to the domestic trade. Robert Grant has branches at Glasgow, Shanghai, London, Melbourne, Kobe, Batavia, Singapore and Calcutta.

The Singer Sewing Machine Co., Elizabethport, N. J., resumed operations at its plant on Jan. 6, giving employment to about 7500 operatives. A shorter working schedule has been placed in effect, with 8-hr. day and five-day week, as against a 9½-hr. day and 5½-day week previous to the recent shutdown. The bonus of 10 per cent heretofore given for full week's work has been discontinued.

The first shipment to England of double-disc metal wheels, manufactured by the Reliance Wheel Co., Youngstown, Ohio, went forward last week. The purchase was made by the Dunlop Tire & Rubber Corporation, Birmingham, England, through its American branch, the Dunlop Tire & Rubber Corp., Buffalo.

British Iron and Steel Market

Reductions in Finished Steel Inevitable—Lower Pig Iron Prices—More Coal Strikes

(By Cable)

LONDON, ENGLAND, Jan. 10.

All finished steel shapes are weak and wholesale reductions in prices are inevitable because buyers will not operate at anything like the present basis. Continental steel is being offered in increasing tonnages at pounds below British prices. Unemployment is increasing, particularly in shipyards and tin plate and galvanized sheet works.

Some anxiety exists regarding coal prices, the government's recent interference with wages apparently compelling payment of higher wages with rapidly increasing surplus stocks and with export coal a drug on the market. Many miners are on strike and some pits are closed, unable to sell output.

There is more inquiry for tin plates, especially stock plates and wasters. Works are selling primes at 33s. basis, f.o.t. More mills are closed and there is some talk of setting up a central agency to handle the Welsh output.

Bar iron has been reduced to £31 10s. for Staffordshire marked bars. General reductions are expected at this week's meeting in Birmingham.

Cleveland pig iron prices have been reduced and now stand as follows:

	Domestic		Foreign	
	s	d	s	d
No. 1 Cleveland.....	225	0	245	0
No. 3 GMB.....	215	0	235	0
No. 4 foundry.....	214	0	229	0
No. 4 forge.....	212	6	217	6
East Coast mixed.....	240	0	245	0

All these prices take effect immediately. Demand is falling off and consumers are not buying, preferring to close down.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.72 for £1, as follows:

Ship plates	£24 10 to £28 0	\$91.14 to \$104.16
Boiler plates	31 0 to 33 0	115.32 to 122.76
Tees	24 0 to 26 0	89.28 to 96.72
Channels	23 5 to 25 5	86.49 to 93.93
Beams	23 0 to 25 0	85.56 to 93.00
Round bars, 3/4 to 3 in.....	25 10 to 27 0	89.28 to 100.44
Rails, 60 lb. and up.....	25 0 to 27 0	93.00 to 100.44
Billets	15 10 to 16 10	57.66 to 61.38
Sheet and tin plate bars.		
Welsh	16 0 to 17 10	59.52 to 65.10
Galvanized sheets, 24 g.....	30 0	111.60
Black sheets, 24 g.....	34 10	128.34
Tin plate base box.....	1 14	6.32
Steel hoops	27 0	100.44
Ferromanganese	32 0 to 33 0	119.04 to 126.48
Coke	3 23 3/4	11.67

Unemployment the Serious Problem—Steel and Pig Iron Markets Dormant

LONDON, ENGLAND, Dec. 23.—The general position does not improve. Things are getting nearer the turning point than they were. Meantime markets decline, trade diminishes, and unemployment increases.

Unemployment is indeed the most serious problem in the country, and suggestions for curing it, or mitigating its evils are many and varied. The labor party's ideas are somewhat remarkable although not perhaps surprising. Their demand is that persons for whom no work is obtainable from the government employment exchanges shall receive maintenance allowances at the rate of at least £2 per week for men and £1.5 per week for women, with additional allowances for dependents. This scheme to be directly provided for by the taxpayers. The government, however, has different ideas. It is understood that it proposes giving to the building trades unions £250,000 in return for the admission into the industry by the latter of 50,000 ex-service unemployed men. This offer is on a basis of £5 for each man admitted to the trade union concerned and trained in any of the trades in the building industry. There are approximately 250,000 skilled men in that industry. The admission of ex-service men to the building trade has been refused by the unions

for some time but it looks as if the question were now approaching some definite solution.

In the meanwhile other suggestions embody measures designed to revive industry, and efforts are being made to instigate trade by barter for the purpose of stimulating exports, such trade of course having been badly hit by the adverse continental exchanges, and the idea is to get round this difficulty.

The Cleveland pig iron market is dull and a revival of interest can hardly be expected at this time of the year. The present output of Cleveland foundry iron is still absorbed by the home market which discounts the announcement of the removal of the embargo on exports, at least so far as early delivery is concerned and continental buyers are naturally disinclined to purchase forward. Foreign competition continues an important factor. The home demand for hematite shows some signs of slackening but prices are steady. Foreign ore is quiet with freights declining.

So far as finished iron and steel is concerned business is practically dormant. Prices generally tend lower partly owing to financial depression, and partly owing to continental competition.

Shipbuilding is now slowing down considerably and it is reported that several good orders have been cancelled. As a matter of fact the ex-enemy tonnage has had a very bad effect on the market for new vessels, while high costs of building and falling freight markets are also important factors.

Brass Cartridge Cases Sold

The War Department authorizes publication of the following statement from the offices of the Director of Sales:

The recent offering of the War Department of approximately 56,250,000 lb. of brass cartridge cases, for which bids were opened on Jan. 5, has resulted in the sale of this material on a basis which is believed to be exceedingly advantageous to the Government, and also in a manner which will allow of the absorption of this large amount of metal without disrupting or unsettling market conditions.

The interest shown was very great as is evidenced by the fact that 46 bids were received. One bid was withdrawn prior to the opening and five other bids were found to be not in accordance with the proposal to bidders, leaving a total of 40 bids which were considered. Thirty-five submitted offers to purchase the entire amount at a stated price. Of these 35, nine bidders submitted also an alternative proposal to purchase this material on a sliding scale based on market conditions. Five bidders submitted only a proposition to purchase this material on a sliding scale based on market conditions.

The high bidder to whom the material was awarded is A. T. Fletcher, 1808 I Street, Washington. The price to be received is based upon the average market value of the constituent metals during the month in which deliveries are made. The analysis of the brass is fixed by mutual agreement at 70 per cent copper and 30 per cent spelter. The sale price is to be adjusted monthly based on market value during the month in which the material is moved as reported by three recognized trade publications to be designated later, less a deduction of 2 cents per pound for refining. As an example, if the average price of copper is 13c. and the average price of zinc is 0.0585c. for the month, the Government will receive 0.08855c. per pound for every pound of brass cartridge cases taken by the purchaser during that month.

The placing of this material on the market being extended over a period of one year at prices which follow and are contingent upon market conditions is expected to prevent the possibility of this material's being used for the purpose of unsettling or unduly influencing the market and furthermore eliminates possible unwarranted speculation. This method of disposition also insures the Government the benefit of all advances in the market prices of the raw materials concerned.

Profits Still Large in German Steel

Krupp Operations on Peace Products Are Highly Successful—Better Outlook in Finished Material—Imports of American Plates—Looking to Russia for Ore

(Special Correspondence)

BERLIN, GERMANY, Dec. 20.—This week the annual report of the Krupp company has been published, with similar splendid results to those shown in other company reports of recent months. Gross earnings, including interest and miscellaneous receipts, are returned at 174,000,000 marks, as compared with 18,000,000 last year. Net earnings are given at 79,657,000 marks, but the entire amount is carried forward to new account. Thus there is again no dividend, as in the two previous years. The net earnings just mentioned appear all the more impressive when compared with a loss of 36,000,000 marks for last year. The company's tax bill is 36,500,000 marks, as against 14,400,000 marks last year. To this must be added workmen's insurance of 13,936,000 marks, compared with 12,500,000 marks. Besides such publicly required contributions for the workmen, the company devoted an additional 43,970,000 marks to welfare work, against 24,300,000 marks last year.

The report points out that for the first time in Krupp's history during the past two generations of men no instruments of war were manufactured in its shops. Further progress has been made in transforming the various branches into workshops of peace production. The cannon factory at Munich, started during the war, was sold at a loss in the course of the year.

Some Price Cutting—Gain in Pig Iron Output

This month there has been little change in the general business situation. Nevertheless, a certain tendency toward weakness may be seen in the fact that in bars and a few other specialties there is now some selling below the official prices fixed in October. The weakening tendency in foreign markets is watched with interest, causing the expectation of a similar movement here; but it is to be noted that the German market has held its own relatively well hitherto, as compared with the American and other western markets. There has hardly been any shrinkage of production as yet, except where shut-downs were occasioned by lack of fuel; and in pig-iron a slight gain this month is mentioned. There is also an increased demand for pig, especially for foundry grades; and further importations have occurred. This was probably from Belgium, where a cut of 25 francs has recently been made in consequence of the failure of an effort to establish a price convention with French furnaces.

Although the furnaces have ample supplies of ores on hand for two or three months, they continue to use greater quantities of scrap in their charges. Such material has become so important that one of the Klöckners, a member of the Reichstag, has just announced an inquiry of the Government regarding the sale of public supplies of old iron. It has been the practice hitherto to offer these at public auction. The inquiry in question points out that these auctions have tended to undue speculation and inflation of prices, so that the disadvantages to the iron trade thereby caused outweigh the advantages reaped by the railroads. Klöckner's idea is that the railroad authorities should be compelled to sell directly to the furnaces; but the former are strongly opposed to this.

Improvement in Plates and Shapes

The supplies of half-manufactured steel in the market are ample for requirements, with some surplus for export. An improvement in the demand for structural forms is reported, and even some difficulty in meeting requirements in heavy shapes is mentioned. A similar improvement in heavy plates is observed; and the ship-plate kontor has large home and foreign orders in hand. In medium thickness, on the other hand, there is an excess of offerings, especially from the Sieger-

land mills. Bars are in good demand, despite the weakening of prices noted above; and two to four months delivery periods are generally stipulated by the works. Some of the more salable numbers can only be had in very small lots.

Conditions in the Upper Silesian district are somewhat less satisfactory than just described for the Ruhr region. The works there have not orders enough to keep them fully employed, and some curtailment of production by introducing shorter hours or throwing off a day has occurred. Foreign buying in particular has fallen off. A rather acute scarcity of pig is reported from that district through the blowing out of several furnaces.

The situation there has been injuriously affected by the violent political agitation over the forthcoming plebiscite.

Locomotive Exports Hampered—Cutlery Trade Poor

A certain improvement of business with the locomotive shops is reported. The workmen have been increasing their output since piecework was again introduced. In this branch of business, however, as in many others, there are still grave complaints about the obstructions to the export trade caused by the Government control. The Henschel & Son Co. of Hanover, one of the largest and best-known manufacturers of locomotives in Germany, was reported a fortnight ago as about to be absorbed into a community of interest arrangement by a western company; but nothing has as yet evolved from that report.

The Solingen cutlery trade remains in an unsatisfactory position. Only in certain branches, like table cutlery, has some improvement occurred; but the general state of business is bad. The shops have very inadequate supplies of coal; electrical current is also furnished in insufficient volume because of the lack of fuel.

Coal Miners Increase Output

Coal production on the Ruhr scored a further gain in daily output in November. It was 331,205 tons, or about 19,000 tons over October and 31,150 tons over September. The rate of production was the greatest since the first half of 1918, which shows that the German workmen are gradually recovering their former capacity to work. The daily rate of production was only about 14 per cent less than for November, 1913. The movement of coal has also been somewhat heavier than in the first week of the month, more cars having become available. Nevertheless industrial establishments of all kinds are still greatly hampered for coal; some are shut down, and many others are running on short time. No relief from the shortage has been marked in the iron industry.

Steel Consumers to Have More Power

Recent expressions from important company directors indicate that a feeling of pronounced pessimism prevails regarding the present socializing movement. The latest ground for concern is found in the fact that a bill, according to report, has been drawn up by the Economic Ministry for the ostensible purpose of making the Iron Industry Union a more self-governing body than it is now. Such a bill might be expected to win the support of manufacturers; but the change turns out to be distinctly hostile to them. The Economic Minister is to surrender his veto right in certain cases, while consumers are to have still larger representation and increased power. Needless to say, iron men are strongly opposed to any such change. They see in it an attempt to take the control of the industry completely out of their own hands and place it else-

where. Their concern is only enhanced by the attitude of the labor representatives in the Union, who seem to feel that they are the agents of a party rather than representatives of an industry. The great Metalworkers' Association even instructed its representatives that in their policy in the Union, they were to regard themselves merely as wage earners and not as representatives of an industry.

Increased Iron and Machinery Capitalizations

Capital operations in the iron and machinery trades continue on a large scale. The great Rhein-Elbe combination, already having capital resources (including reserves and bonds) of about 1,200,000,000 marks, has decided to raise new capital amounting to 450,000,000 marks. The Phönix company is raising 30,000,000 marks new capital, bringing its total up to 136,000,000 marks. This is for the purpose of carrying through the absorption of "Zollverein" coal mine. The Rheinische Metallwaren und Maschinenfabrik of Düsseldorf, which for some years before the war was a sort of rival of Krupp's in the manufacture of artillery, is also discussing a capital increase, probably to 50,000,000 marks. Its capital, now 25,750,000 marks, was doubled only at the last meeting. There are rumors that it is to be absorbed by some other concern. It would not be surprising if the acquiring company turns out to be Krupp's, which for years was the "great unknown" stockholder in the company. The Buderus Company of Wetzlar has also just raised its capital to 48,750,000 marks.

The well known machine tool company, Ludwig Loewe of Berlin, which has been operating on so small a capital as 15,000,000 marks, is about to double it. The Augsburg-Nuremberg Co., builder of heavy gas engines and Diesel motors, has been increasing its capital with astonishing rapidity. During the past business year is raised 18,000,000 marks new capital, besides issuing 25,000,000 marks in bonds. During the current business year it has further raised its capital to 100,000,000 marks by issuing 46,000,000 marks new stock; and in addition to this it has made a further issue of 50,000,000 marks bonds. It will be recalled that the Gutehoffnungshütte effected a combination with this company in November.

After it had been reported several weeks ago that the Dutch firm of William Müller & Co. of Rotterdam had acquired the Kraft furnace near Stettin, it now turns out that the Stumm Brothers have defeated that operation and secured Kraft for themselves. Kraft had acquired several years before the war a rolling mill in the Ruhr district, the Neiderrheinische Hütte at Duisburg. This and several other Kraft properties are acquired by the Stumms.

Amstee Active in Plates

The Amstee Co., which was established here some months ago as a branch of the American Steel Export Association, informs me that it is now importing 5000 tons monthly of ship plates from the United States to Germany. This business is handled by its Hamburg branch, which has as manager E. Schaltenbrand, who is well known in the American trade. The company recently established a branch at Vienna, from which center agencies are being planted throughout Balkan countries.

Russian Iron Ore for Germany

Attention is being given to the possibilities of Russia and Ukraine as sources of iron ore supply for Germany. It is pointed out that the ore reserves of those territories have been found far greater than reported at the International Geological Congress at Stockholm in 1910. The estimate given there was 900,000,000 tons, inclusive of Poland; but later investigations, it is now asserted, have shown that figure to be much too low. The best developed ore field is that of Krivoi Rog, on the borders of the former governments of Cherson and Jekaterinoslav, covering a strip of about 35 by 8 miles. The brown iron ores are of excellent quality, as was found by Silesian furnaces that smelted them extensively before the war. The mines already partly exploited are estimated as containing reserves

of about 800,000,000 tons, while the greater part of the deposits is still unscratched. That district supplied 70 per cent of Russia's iron ore output before the war.

A still more important ore field, lying in the old Government of Kursk, appears to be of quite enormous extent and seems not yet to have been worked at all. According to Swedish reports, the field has been surveyed by Prof. Leyst of Moscow by geo-magnetic methods. There are two deposits of magnetic gravel ore, lying parallel to each other at a remove of about 37 miles, with the existing boundary of Russia and Ukraine dividing them. The length of the deposits is a little more than 100 miles; the width is not stated, but the thickness of the beds appears to be very great. The report says rather vaguely that "at the chief centers" the ore deposits cover nearly 2000 square miles. These are only a part of the ore fields of Russia and Ukraine.

Steel Output Less in December

The American Iron and Steel Institute's statistics of steel ingot production of the United States in December show that 30 companies which in 1919 produced 85.12 per cent of the total had an output last month of 2,340,365 gross tons, as against 2,638,670 tons in November and 3,015,982 tons in October. The falling off from November 1 was about 11.5 per cent. Estimating the production of other companies on the basis of those reporting, the total production of ingots in December was 2,749,489 tons, or 105,750 tons per operating day, counting 26 working days, against an estimated November total of 3,099,941 tons, or 119,208 tons per operating day.

The outputs of Bessemer and open-hearth works are separated in the tables below. It will be noticed that there was a relatively small falling off in Bessemer steel. No figures are given for the last five months of 1919, as the steel strike came in the early part of that period:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 85 Per Cent of Total in 1919—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1919....	2,351,153	749,346	7,279	3,107,778
February	2,043,635	655,206	5,842	2,704,683
March	2,100,528	555,332	6,405	2,662,265
April	1,732,447	500,770	6,494	2,239,711
May	1,506,015	414,392	8,617	1,929,024
June	1,692,257	521,634	5,328	2,219,219
July	1,875,630	625,246	7,300	2,508,176
August	1,988,651	748,212	9,218	2,746,081
January, 1920....	2,242,758	714,657	10,687	2,968,102
February	2,152,106	700,151	12,867	2,865,124
March	2,487,245	795,164	16,640	3,299,049
April	2,056,336	568,952	13,017	2,638,305
May	2,251,544	615,932	15,688	2,883,164
June	2,287,273	675,954	17,463	2,980,690
July	2,135,633	653,888	13,297	2,802,818
August	2,299,645	695,003	5,784	3,000,432
September	2,300,417	693,586	5,548	2,999,551
October	2,335,863	676,634	3,485	3,015,982
November	1,961,861	673,215	3,594	2,638,670
December	1,687,162	649,617	3,586	2,340,365
Total, 1920....	26,197,843	8,112,753	121,656	34,432,252

The total production of ingots in 1920 by the 30 companies reporting was 34,432,252 tons. On that basis the country's production of ingots last year was not far from 40,000,000 tons.

Building took another slump in Chicago in the month of December, breaking the many low records made in construction work during 1920. Only 80 permits for industrial buildings were issued during the month as compared with 121 for November and 120 for December, 1919. Total permits for December, 1920, including industries, residences, apartments, and miscellaneous structures involved a cost of \$5,308,000 and 5885 ft. frontage, as compared with \$8,974,750 and 13,367 ft. for December, 1919.

Landers, Frary & Clark, New Britain, Conn., cutlery, etc., have purchased the Greenwood Mills, New Hartford, Conn., property. New machinery is being installed at the plant and operations will start about Feb. 1. The company paid about \$280,000 for the property.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	\$0.35	St. Paul	0.695
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.78
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.33	Pacific Coast, ship	
Indianapolis	0.345	plates	1.335
Chicago	0.38	Birmingham	0.765
St. Louis	0.475	Jacksonville, all rail..	0.555
Kansas City	0.815	Jacksonville, rail and	
Kansas City (pipe)...	0.78	water	0.46
		New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e. New York, Philadelphia and Baltimore), to Pacific Coast ports of call on all steamship lines via the Panama Canal are as follows: Pig iron, 55c.; ship plates 70c., ingots and muck bar, structural steel, tin plate, sheets, common wire products, 75c.; pipe not over 8 in. in diameter, 85c.; over 8 in. in diameter, 2½c. per inch, or fraction thereof additional.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50 and shorter than 1 in., \$2. Bright Bessemer and basic wire, \$3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.25; galvanized wire, \$3.95; galvanized barbed wire, \$4.10; galvanized fence staples, \$4.20; painted barbed wire, \$4.40; polished fence staples, \$3.50; cement-coated nails, per count keg, \$2.85; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 to 60½ per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$4.25
Large boiler rivets.....4.35
Small rivets......60 per cent off list
Small machine bolts, rolled threads......60 per cent off list
Same sizes in cut threads......50 and 10 per cent off list
Longer and larger sizes of machine bolts.....45 and 5 per cent off list

Carriage bolts, ¾-in. x 6-in.:
Smaller and shorter, rolled threads.....40, 10 and 5 per cent off list
Cut threads.....40 and 5 per cent off list
Longer and larger sizes.....40 and 5 per cent off list
Lag bolts......60 per cent off list
Plow bolts Nos. 1, 2 and 3 head......50 and 5 per cent off list
Other style heads......20 per cent extra
Machine bolts, c.p.c. and t. nuts ¾-in. x 4-in.:
Smaller and shorter.....40, 10 and 5 per cent off list
Longer and larger sizes.....40 per cent off list
Hot pressed sq. or hex. blank nuts.....\$2.25 off list
Hot pressed nuts, tapped.....\$1.75 off list
c.p.c. & t. sq. or hex. nuts, blank.....\$2.25 off list
c.p.c. & t. sq. or hex. nuts, tapped.....\$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
¾ to 9/16-in. inclusive. 70 and 10 to 75 and 10 per cent off list
¾ to 1 in. inclusive......65 to 70 per cent off list
Stove bolts in packages......75 and 10 per cent off list
Stove bolts in bulk......75, 10 and 2½ per cent off list
Tire bolts......50 per cent off list
Track bolts......550c. base

Square and Hex. Head Cap Screws

¾ in. and under......65 and 10 to 70 per cent off list
¾ in. to ¾ in......65 to 70 per cent off list

Set Screws

¾ in. and under......70 and 5 to 70 and 10 per cent off list
¾ in. to ¾ in......65 and 10 to 70 per cent off list
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$57; screw stock rods, \$62; rivet and bolt rods and other rods of that character, \$57; high carbon rods, \$68 to \$75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$3.65 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ¼-in., ½-in. and 7/16-in., \$4.50; 5/16-in., \$5.25. Boat and barge

spikes, \$4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, \$5.50 base per keg of 200 lb. Tie plates, \$3 to \$3.60 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, 1 C., \$14.10; 12-lb. coating, 1 C., \$15.80; 15-lb. coating, 1 C., \$16.80; 20-lb. coating, 1 C., \$18.05; 25-lb. coating, 1 C., \$19.30; 30-lb. coating, 1 C., \$20.30; 35-lb. coating, 1 C., \$21.30; 40-lb. coating, 1 C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Refined bar iron, 3.75c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Steel		Butt Weld		Iron	
Inches	Black	Galv.	Inches	Black	Galv.
1½, 2 and 2½	50½	24	1½	15½ to 16½	+10½ to 11½
2½	54½	40	2½	19½ to 20½	1½ to 2½
3 to 3½	57½	44	3 to 3½	24½ to 25½	8½ to 9½
Lap Weld					
2	50½	38	2	20½ to 21	8½ to 7
2½ to 6	53½	41	2½ to 6	22½ to 23	9½ to 10
7 to 12	50½	37	7 to 12	19½ to 20	8½ to 7
13 and 14	41				
15	38½				
Butt Weld, extra strong, plain ends					
1½, 2 and 2½	46½	29	1½	+16 to 17	+40 to 50
2½	51½	39	2½	13½ to 14½	+2½ to 3½
3 to 3½	55½	43	3	18½ to 19½	8½ to 9½
4 to 5	56½	44	4 to 5	24½ to 25½	9½ to 10½
Lap Weld, extra strong, plain ends					
2	48½	37	2	21½ to 22½	8½ to 9
2½ to 4	51½	40	2½ to 4	23½ to 24	11½ to 12
4½ to 6	50½	39	4½ to 6	22½ to 23	10½ to 11
7 to 8	46½	33	7 to 8	14½ to 15	2½ to 3
9 to 12	41½	28	9 to 12	9½ to 10	+2 to 2½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		Charcoal Iron	
1½ to 2 in.....	19½	1½ to 1¾ in.....	+23
2½ in.....	24	1¾ to 1½ in.....	+20
2½ to 3½ in.....	30½	2 in.....	+10 to 15
3½ to 4½ in.....	40½	2½ in.....	+10 to 12
		2½ in.....	+1 to 10
		2½ to 3½ in.....	+1½ to +3
		3½ to 4½ in.....	—8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	\$327	1½ in.	\$207
1¼ in.	267	2 to 2½ in.	177
1½ in.	257	2½ and 3 in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed		Box Annealed, One Pass Cold Rolled	
Cents	Per Lb.	Cents	Per Lb.
No. 8 and heavier.....	3.45	No. 13 and 14.....	3.65
Nos. 9 and 10 (base)...	3.55	Nos. 15 and 16.....	3.75
Nos. 11 and 12.....	3.60		
Galvanized Black Sheet Gage			
Cents	Per Lb.	Cents	Per Lb.
Nos. 10 and 11.....	4.70	Nos. 25 and 26.....	5.40
Nos. 12 to 14.....	4.80	No. 27.....	5.55
Nos. 15 and 16.....	4.95	No. 28 (base).....	5.70
Nos. 17 to 21.....	5.10	No. 29.....	5.95
Nos. 22 to 24.....	5.25	No. 30.....	6.20

Tin-Mill Black Plate

Cents	Per Lb.	Cents	Per Lb.
Nos. 15 and 16.....	4.15	No. 28 (base).....	4.35
Nos. 17 to 21.....	4.20	No. 29.....	4.40
Nos. 22 to 24.....	4.25	No. 30.....	4.40
Nos. 25 to 27.....	4.30	Nos. 30½ and 31.....	4.45

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York			Lead		Spelter		
	Lake	Electro-lytic	Tin New York	New York	St. Louis	New York	St. Louis
Jan. 5.....	13.25	13.00	37.00	4.90	4.75	6.00	5.50
6.....	13.25	13.00	37.50	5.00	4.85	6.00	5.50
7.....	13.25	13.00	38.00	5.00	4.85	6.00	5.50
8.....	13.25	13.00	38.00	5.00	4.85	6.00	5.50
10.....	13.25	13.00	39.00	5.00	4.85	6.00	5.50
11.....	13.25	13.00	38.75	5.00	4.85	6.00	5.50

NEW YORK, Jan. 11.

There is a distinctly better feeling in all the markets. Demand for copper is still light but prices are firmer. Tin is considerably higher, due partly to the increase in the pound sterling. Lead is the most active and strongest of the markets. Demand for zinc is still light and prices stationary.

New York

Copper.—There is a distinctly more optimistic feeling in the copper market despite the fact that demand is still light. Apparently the cheaper lots have been eliminated and as a result the price situation is firmer. It is hardly possible to purchase electrolytic copper for less than 13c., New York, for early delivery against 12.50c. to 12.75c. a week or more ago. There is more inquiry than for some little time, but no buying movement is expected very soon. We quote electrolytic copper for early delivery at 13c., New York, and 13.25c. for first quarter with Lake copper at 13.25c. and 13.50c. for the same positions, respectively.

Tin.—The tin market is distinctly stronger. There has been a fairly good revival in the buying of Straits tin and sales have been made in the past week, both for shipment from London and from the Far East. More metal could have been sold had there been more sellers. Both consumers and dealers were buyers. While there was a fair number of buyers and the competition sharp, no great quantity of tin was offered, being limited to lots of 35 and 50 tons. An interesting development was the shipment of 620 tons of American electrolytic tin to Liverpool. On Saturday, Jan. 8, some business was done at 38c. for spot Straits and at 38.50c. for February-March shipment. In the week prices of spot Straits tin, New York, have advanced until to-day the quotation is 38.75c., New York. This advance is due partly to the sharp increase in the pound sterling, as well as to a higher market in London.

Lead.—There has been a very good demand and it is admitted that large sales have been made. Prices in the outside market have hardened considerably until they are now higher than that of the leading interest which still remains unchanged at 4.75c., New York and St. Louis, but an advance is looked for any day. We quote the outside market at 5c., New York, or 4.85c., St. Louis. The market has decidedly reversed itself in the past week or so and is distinctly the strongest of the group. While no large surplus has been accumulated in the recent period of inactivity, it is pointed out that a close watch should be kept on the London market in order to provide against a possibility of further imports.

Zinc.—Demand for zinc continues exceedingly light and there is practically no change in the situation except that the London market is a little stronger. We quote prime Western for early delivery at 5.50c., St. Louis, or 6c., New York, with demand and sales exceedingly light.

Antimony.—The market continues dull with wholesale lots for early delivery quoted at 5.20c., New York, duty paid.

Aluminum.—The leading interest quotes virgin metal in wholesale lots for early delivery at 28.30c., f.o.b. producer's plant, while sellers in the outside market offer the same grade at 22c. to 23c., New York.

Old Metals.—The market shows practically no

change in prices, though there seems to be a little better feeling in the trade. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	12.75
Copper, heavy and wire.....	12.00
Copper, light and bottoms.....	10.00
Brass, heavy.....	9.25
Brass, light.....	6.75
Heavy machine composition.....	12.50
No. 1 yellow rod brass turnings.....	7.50
No. 1 red brass or composition turnings.....	10.00
Lead, heavy.....	4.00
Lead, tea.....	3.00
Zinc.....	3.25

Chicago

Jan. 11.—Although a few good sized orders in copper have been taken, buying in the aggregate is exceedingly limited and Lake copper has declined to 13.50c., while electrolytic is available at from 13c. to 13.50c. Tin has advanced because of a stiffening in sterling exchange and the establishment of a minimum selling price by the Federated Malay States. There is considerable dealing in Chinese tin, however, and it is questionable whether an artificial price can be maintained for long. Lead has gone up principally because an advance by the leading producer is anticipated and independents will no longer accept business at lower prices. Although it is believed that the appearance of even a small volume of buying would result in an advance in spelter, the market in this metal is complicated by the fact that exporters trade in it on both sides of the Atlantic and recent forced offerings abroad demoralized domestic prices. The present prices of zinc and copper are considered exceptionally low in relation to costs. We quote Lake copper at 13.50c. in carload lots; tin, 38c. to 39c.; lead, 4.95c.; spelter, 5.65c. to 5.75c.; antimony, 7c. to 7.50c. On old metal we quote copper wires, crucible shapes, 9c.; copper clips, 9c.; copper bottoms, 7.50c.; red brass, 9c.; yellow brass, 6c.; lead pipe, 3c.; zinc, 3c.; pewter, No. 1, 17c.; tinfoil, 20c.; block tin, 25c.; all these being buying prices for less than carload lots.

St. Louis

Jan. 10.—The non-ferrous markets have shown a better tone during the week with the closing quotations as follows: Car lots, lead, 4.80c. to 4.85c.; spelter, 5.50c. to 5.60c. Less than car lots, lead, 5.75c.; spelter, 7c.; tin, 42c.; copper, 14c.; antimony, 7.50c. In the Joplin district ores were quiet with the sales for the week about half the normal quantity, because of the low prices offered. Zinc blende was quoted at \$28.50 to \$29 per ton, basis 60 per cent. Lead, basis 80 per cent, \$47.50 per ton, and calamine, basis 40 per cent, \$25 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 4c.; heavy yellow brass, 6.50c.; heavy red brass, 10c.; light copper, 9c.; heavy copper and copper wire, 9c.; tea lead, 2c.; zinc, 3c.; lead, 3.50c.; pewter, 18c.; tinfoil, 20c.; aluminum, 10c.

The Standard Screw Products Co., Detroit, has recently completed and placed in operation a new cold heading department which will be used largely in the manufacture of special products. This company has also acquired the plant of the Hardened Steel Products Co., Detroit, which was engaged in the manufacture of hardened and ground products of a precision character, the plant investment of this company being approximately \$175,000. Philip H. Smith has become sales manager of the Standard Screw Products Co. He was formerly identified with the Brown & Sharpe Mfg. Co., Providence, R. I., and recently had been with the Brown-McLaren Mfg. Co., Detroit.

"The Trend of Our Foreign Trade" is the title of number 43 of the series of booklets being issued by the Irving National Bank, Woolworth Building, New York. It contains 20 pages, the subject matter being an address delivered by G. A. O'Reilly, vice-president of the Irving National Bank, before the Massachusetts State Chamber of Commerce in Boston.

WHAT IS INVESTED CAPITAL?

Question Involved in Suit of La Belle Iron Works to Recover One Million Dollars

WASHINGTON, Jan. 11.—Arguments took place in the Supreme Court of the United States during the past week in the case of La Belle Iron Works, which is seeking to recover more than \$1,000,000 paid under protest as excess profits taxes. The case involves the definition of "invested capital" and is one of the most important affecting the interpretation of the excess profits section of the revenue law which has reached the Supreme Court. A decision adverse to the contention of the Government would mean the refunding of many millions of dollars of taxes already paid into the treasury.

The case is of such importance, affecting large business interests of various kinds, that the National Lumber Manufacturers' Association and other organizations and individual companies interested in the matter filed briefs and participated in the oral arguments before the court.

The case of the La Belle Iron Works involved an increase in value of iron ore lands purchased many years previously. The specific question is whether the mere increase in the value of lands previously purchased and still owned by a corporation is invested capital within the meaning of the act of Congress.

The La Belle Iron Works acquired ore lands prior to the year 1904 for the sum of \$190,000. Extensive exploration and development work was carried out and it was proved that the lands contained large bodies of ore. The value of the property increased until it was not less than \$10,105,400, at which sum the company in 1912 capitalized the ore properties on its books. In that year the old stock consisting of par value of \$9,915,400, all of one class, was called in and the charter was amended, fixing the authorized issue at \$10,000,000 par value of common stock and \$10,000,000 par value of preferred stock. All the old outstanding stock was surrendered by the stockholders of the company and cancelled and each stockholder received in exchange one share of the new common stock and one share of the new preferred stock in place of each share of the original stock outstanding.

In making its tax return for the year 1917, the company showed its "invested capital" to be \$26,322,904.14, which included the ore lands at the sum of \$10,105,400. Upon this return the company paid an income and excess profits tax of \$5,139,109.84. The commissioner of internal revenue later caused a reassessment of the tax to be made and assessed an additional tax of \$1,081,184.61. This tax was arrived at by reducing the "invested capital" to \$16,407,507.14 by striking out the increase in the value of the ore lands, \$9,915,400.

The company paid this additional tax on Feb. 24, 1920, under duress and protest and is the amount which it seeks to recover in the pending suit. The claimant filed a claim for refund on March 17, 1920, which was denied on April 8, 1920, by the commissioner of internal revenue. The case then was taken to the court of claims which sustained the demurrer of the United States Government and dismissed the claimant's petition. Solicitor General Frierson summarizes the issues involved thus:

"The appellant's theory is that the capital invested in its ore lands is not what it paid for them but is to be measured by the present value of the lands and that, therefore, the full value of these lands must be treated as a part of the invested capital upon which the deduction is to be based.

"The Government contends, on the other hand, that the act clearly defines the 'invested capital' as the amount received in exchange for its shares of stock plus any 'paid in or earned surplus' used in its business; that appellant invested in the purchase of these lands only \$190,000, and, no matter how long it holds them or how much their value may fluctuate, that sum remains the amount of capital invested in them; and that paid in or earned surplus and undivided profits do not include the unearned increment arising from

the mere holding of lands until they increase in value, or the potential but unrealized profits which would accrue on the investment if the owner chose to sell.

"These contentions make the concrete issue—is the deduction to be based upon the amount of capital which the corporation has invested, or upon the value, at a particular time, of the property in which that capital has been invested?"

Large Production of Coal and Coke in 1920

WASHINGTON, Jan. 11.—Complete figures on coal production for the calendar year 1920 show that the amount of bituminous coal produced was greater than during any year except the war maximum of 1918. The output of anthracite was but little greater than that of 1918, the latest normal year, but was far short of both of the years 1917 and 1918.

Bituminous coal production in 1920 totaled 557,000,000 tons. The 1918 production was 579,000,000 tons. Production in 1916 was 503,000,000, in 1917 it was 552,000,000, and in 1919, 458,000,000 tons.

Anthracite coal production totaled 89,000,000 tons in 1920 as against 88,000,000 in 1919. The record year, 1917, produced 100,000,000 tons. The total in 1916 was 88,000,000 tons, and in 1918, 99,000,000 tons.

Total production of beehive coke in 1920 was 20,833,000 tons as against 19,650,000 in 1919, an increase of six per cent.

Production declined all along the line during the last week of the year. The total output of bituminous coal was 9,571,000 tons, a decrease of 112,000 tons from the preceding week. That of anthracite was 1,582,000 tons a decrease of 44,000 tons. The production of beehive coke was 280,000 tons, which was practically the same as during the preceding week.

Large Decrease in Unfilled Orders

Unfilled orders on the books of the United States Steel Corporation, Dec. 31, were 8,148,122 tons, compared with 9,021,481 tons on Nov. 30. This is a decrease of 873,359 tons, against one of 815,371 tons on Nov. 30, 537,952 tons on Oct. 31; 430,234 tons on Sept. 30; and 313,430 tons on August 31; and an increase of 139,651 tons in July; 38,352 tons in June; 580,718 tons in May; 467,672 tons in April; 389,994 tons in March; 216,640 tons in February and 1,020,075 tons in January. The unfilled tonnage a year ago was 8,265,366 tons or 117,244 tons more. The table below gives the unfilled tonnage at the close of each month, beginning with January, 1917:

	1920	1919	1918	1917
Jan. 31.....	9,285,441	6,684,268	9,477,853	11,474,054
Feb. 28.....	9,502,081	6,010,787	9,288,443	11,576,697
Mar. 31.....	9,892,075	5,430,572	9,056,404	11,711,644
Apr. 30.....	10,359,747	4,800,685	8,741,882	12,183,083
May 31.....	10,940,465	4,282,310	8,337,623	11,886,591
June 30.....	10,978,817	4,892,855	8,918,866	11,383,287
July 31.....	11,118,468	5,578,661	8,883,801	11,844,164
Aug. 31.....	10,805,038	6,109,103	8,759,042	10,407,049
Sept. 30.....	10,374,804	6,284,638	8,297,905	9,833,477
Oct. 31.....	9,836,852	6,472,668	8,353,293	9,009,675
Nov. 30.....	9,021,481	7,128,330	8,124,663	8,897,106
Dec. 31.....	8,148,122	8,265,366	7,379,172	9,381,718

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

International Steel Corporation Liquidating

The International Steel Corporation, a subsidiary of the American International Corporation, organized a few years ago to engage in iron and steel exports, is going out of business. The closing of its affairs will require some months, and Morris Metcalf, president of the steel company, will remain in charge of the liquidation, at the present quarters, 51 Chambers Street, New York. Inability to secure deliveries from mills on low price contracts when transportation difficulties put prompt shipment material at high prices is ascribed as a reason for withdrawing from business, in addition to general world-wide conditions, or in other words, the company was without close mill affiliations regarded as essential to a large foreign selling organization.

PERSONAL

Col. W. P. Barba, former vice-president Midvale Steel & Ordnance Co., has been elected chairman of the board of directors of the Penn Seaboard Steel Corporation, Philadelphia, succeeding Rodney Thayer, who resigned. Mr. Thayer has returned to Europe, where he will remain indefinitely. Alfred P. Sloan, Jr., vice-president General Motors Corporation, has been elected a member of the company's board of directors. This makes two officials of the General Motors Corporation who are now serving as directors of Penn Seaboard Steel Corporation, the other being J. G. Weiss, president Hyatt Roller Bearing Co., Harrison, N. J., which is a subsidiary of General Motors.

D. E. Sawyer was again elected general sales manager for 1921 at a recent meeting of the board of directors of the Pollak Steel Co., and is still located at the New York office of the company. S. K. Morrow, formerly manager of operations, is now manager of sales for the three plants, with the offices at the Cincinnati works. C. G. Talbott, formerly assistant manager of operations, is now manager of rolled products for the Marion plant. A. C. Wehl, for several years superintendent of the Cincinnati plant, is now general works manager in charge of operations and productions of the Cincinnati, Chicago and Marion plants. V. W. Prather, formerly cost auditor for the Cincinnati plant, is now general cost auditor of three plants. R. A. Mitchell takes the position vacated by Mr. Wehl to become superintendent of the Cincinnati plant. J. H. Deickman becomes manager of materials and inspection of three plants. W. P. Woods becomes auditor and G. H. Tallaksen, superintendent of the Chicago plant.

Horace H. Lane, one of Detroit's prominent industrial engineers, has taken two partners. They are H. Daziel Davenport and A. A. Peterson. The firm name will be Lane, Davenport & Peterson. They will have offices at 2320 Dime Bank Building, Detroit.

Benton Hopkins has been appointed Cleveland branch manager of the H. H. Robertson Co., Pittsburgh manufacturer of the Robertson process metal. His offices will be located in the Kirby Building. Arthur B. Shepard, who for 12 years has been district manager of the Cleveland sales office of the Robertson Co., has resigned to take up the management of the Arthur B. Shepard Co., manufacturer of structural steel buildings.

Harry P. Meredith, formerly with the Curtiss Aeroplane & Motor Corporation, has been made general works engineer of the Maxwell-Chalmers Co., Inc., Detroit. He will have charge of building design of plants in Detroit, Dayton, Ohio, Newcastle, Ind., and Canada.

Prof. Edward H. Rockwell, Tufts Engineering School, Medford, Mass., is president of a newly-created structural section of the Boston chapter, American Association of Engineers; Paul B. Covey is vice-president; and R. B. Johnson, Harvard University, secretary-treasurer.

Horace Mager has become associated with the J. S. Morrison Co., Oliver Building, Pittsburgh, and will handle the Eastern representation of the Marietta Mfg. Co., Point Pleasant, W. Va., selling structural, plate and general machine work. Mr. Mager was formerly with the purchasing department of the Aluminum Co. of America.

Meiggs H. Whaples, A. W. Stanley, R. N. Peck, J. E. Cooper, F. G. Vibberts, P. B. Stanley and J. W. Wilbur, Jr., were elected directors of the Stanley Rule & Level Co., New Britain, Conn., at the annual meeting last week. At a subsequent meeting of the directors A. W. Stanley was made president and treasurer; R. N. Peck, vice-president; J. W. Wilbur, Jr., secretary; and Miss F. J. Taylor, assistant secretary.

J. R. Harbeck, New York, has resigned as vice-president and director of the American Can Co., to devote his time exclusively to automobile interests.

M. L. Northrop has been appointed New England

representative of the Warren Foundry & Machine Co., 11 Broadway, New York. His headquarters will be at 201 Devonshire Street, Boston. He was formerly with the Pittsburgh Meter Co. and more recently superintended the construction of a water filtration plant at Saco, Me.

S. Walter Platt has resigned as Pittsburgh manager of Luria Brothers & Co., Woolworth Building, New York, iron and steel scrap.

Robert Grant, Woolworth Building, New York, iron and steel exporter, has added a line of chemicals and has secured John P. Allen to handle this branch. Mr. Allen was formerly sales manager of Marden, Orth & Hastings, Inc., 136 Liberty Street, New York.

Herbert A. Carhart, formerly assistant superintendent Lincoln Motor Co., Detroit, recently resigned to organize Carhart Brothers Foundry, Inc., Syracuse, N. Y. Mr. Carhart is president and manager of the company which will produce gray-iron castings and other light to medium machine parts.

Thomas E. Hyde, formerly works manager of the Huhn Mfg. Co., Arlington, N. J., has been appointed factory manager of the National Pipe Bending Co., New Haven, Conn.

F. L. Cook, for several years head of the sales and publicity department of the Chicago Bridge & Iron Works, has been placed in charge of the entire Pacific Coast, as representative of the Chicago firm. He has offices in the Rialto Building, San Francisco. The Southern California representative is Charles H. Sheldon, with headquarters in the Wright-Callender Building, Los Angeles.

Martin J. Root, formerly of the Fairbanks Co., has been made president of the U. S. High Speed Steel & Tool Corporation, which has been reorganized. The headquarters of the company are at 489 Fifth Avenue, New York, near Forty-second Street.

H. M. Lowenstein has taken a position as designer with the Babcock & Wilcox Co., Bayonne, N. J. He was formerly designer for the De La Vergne Machinery Co.

Joseph J. Zumberg has severed connections with the Cincinnati Milling Machine Co. to become connected with the Oesterlein Machine Co. of Cincinnati as chief draughtsman.

A. P. Preyer has been appointed Cincinnati district manager of the American Rolling Mill Co. to succeed J. A. Henry, who resigned to enter business in Chicago. Mr. Preyer has been connected with the American company for over 15 years at the Middletown offices. He took over the Cincinnati office on Jan. 1.

John M. Huffman has resigned as general manager of the Davis Sewing Machine Co., Dayton, Ohio, and will enter the bond and securities business with his brother, Frank Huffman, Jr.

H. W. Croft has been elected chairman of the board of the Harbison-Walker Refractories Co. Mr. Croft, who was formerly president, is succeeded by John E. Lewis. N. McQuillen has been elected vice-president.

C. H. Israel, formerly works manager of the National Marine Engineering Works, Scranton, Pa., has been appointed Eastern representative of the Kingsford Foundry & Machine Works, Oswego, N. Y., with headquarters at the Philadelphia office of the company.

Charles L. Langlotz, the new assistant manager of the export division of the H. H. Robertson Co., New York, was formerly assistant regional manager of the Allied Machinery Co. of America, New York.

F. J. Frey, who with his two brothers-in-law, William Geuder and Charles A. Paeschke, formed the Geuder, Paeschke & Frey Co., Milwaukee, was presented with an unusual souvenir book on the company's fortieth anniversary. This book was an unusual compilation of portrait photographs of the members of the firm and their various places of business and working forces at different outstanding periods in the company's development. Mr. Geuder died in 1902, but the business has

been carried on under the same name by Messrs. Paeschke and Frey.

Ray Mayhew, until recently motor engineer for the American Hoist & Derrick Co., is now connected with the Clyde Iron Works, Duluth, Minn.

George A. Ward, recently appointed member of the engineering department of the International Coal Products Corporation, Newark, N. J., was formerly with the Wilputte Coal Oven Corporation, New York.

Major A. E. Bellis, metallurgist United States Armory, Springfield, Mass., presented a paper on "Some of the Essentials in the Treating of High Speed Steel" before the Boston chapter, American Society for Steel Treating, at the Engineers' Club, Boston, on the evening of Jan. 7.



W. H. DARRAH

W. H. Darrah, for 28 years with the Upson Nut Co., Cleveland, and its successor, the Bourne-Fuller Co., mostly as representative in the Middle West territory with headquarters at Chicago, has resigned and now represents the Michigan Bolt & Nut Works, Detroit, in the same territory with headquarters at 1444 Birchwood Avenue, Chicago.

John R. LeValley, formerly sales engineer with the Chicago office of the Locomotive Superheater Co., has been appointed district manager of its new office at 382-388 Union Arcade Building, Pittsburgh. Mr. LeValley is a graduate of Armour Institute of Technology. He was associated for several years with M. Rumely Co., La Porte, Ind., in assembling and testing tractors. Subsequently he was construction and power engineer for Armour & Co.'s Chicago plant, and later was superintendent of construction and power plants for the Union Stock Yards & Transit Co. and the Produce Terminal Corporation, having charge of design, purchasing and erection of several large power plants. For 18 months he was an officer in the Navy, serving on the battleship Vermont and the United States transport Huron.

Robert Lacy has resigned from the George T. Ladd Co., Pittsburgh, to accept a position as sales engineer and representative of the Rush Machinery Co., Pittsburgh, manufacturer of steam equipment specialties and water-tube boilers.

Harold S. Spring, 527 Lenox Avenue, Zanesville, Ohio, is organizing a wholesale factory, mill and mine company at Zanesville to engage in the jobbing business.

Robert Lock, recently elected president of the Ashtabula Steel Co., Ashtabula, Ohio, was formerly president of the Vulcan Iron & Steel Co., Pittsburgh.

J. T. Geoghegan has resigned as mechanical engineer with the Southern Railway Lines West, Cincinnati, to become sales engineer with the American Car & Foundry Co., Chicago.

Frank D. Fagan, formerly manager lamp department, General Electric Co., at San Francisco, has been made vice-president and general manager of the Edison Storage Battery Co., Orange, N. J. Edwin M. Cutting, formerly Western manager of the Edison Storage Battery Co. at San Francisco, has been made assistant to the general manager.

W. K. Millholland has disposed of part of his interest in the Millholland Machine Co. and has resigned as president and general manager. E. Millholland has resigned as works manager and director and sold part of his holdings in the Millholland Machine Co. The Millholland Sales & Engineering Co. has been formed by W. K. Millholland and E. Millholland. Temporary offices are at 304 Rauh Building, Indianapolis. A sales and display room will be occupied about March 1. Their entire attention will be given to selling machine shop and foundry equipment and engineering work.

OBITUARY

JOHN MACK, for many years president and treasurer of the Mack Axe Works, Beaver Falls, Pa., died at his home, New Brighton, Pa., Jan. 8, of pneumonia. He was born at Jamestown, N. Y., 55 years ago. He learned the business in Jamestown and went to Beaver Falls in 1900 as superintendent of the American Tool & Axe Co. When that company abandoned its plant at Beaver Falls to locate at Glassport, Pa., in 1909, Mr. Mack purchased the plant and organized the Mack Axe Works. Two years ago he sold the plant to the Remington Arms Co. and was retained as consulting manager.

CHARLES D. WILLARD, for many years superintendent of the Hayden foundry at Columbus, Ohio, died in that city on Jan. 1. Mr. Willard was 74 years of age, and was a son of John Willard, one of the pioneer settlers of Columbus.

COLIN CAMPBELL, founder and president National Hoisting Engine Co., Harrison, N. J., died at his home at 642 Parker Street, Newark, on Dec. 26, at the age of 66 years. Mr. Campbell was born in Scotland and came to this country in 1887. He worked as a machinist until he entered business for himself about 20 years ago.

WILLIAM HEYSHAM SAYRE, president American Abrasive Metal Co., 6 Church Street, New York, died at his home, 181 Ridgewood Avenue, Glen Ridge, N. J., Jan. 6. He was born at Bethlehem, Pa., 1865, and was a graduate of Lehigh University.

CONRAD FURST, formerly president Machinists' Supply Co., 19 North Jefferson Street, Chicago, died recently in that city. Mr. Furst was born in 1829 and went to Chicago in 1849. In 1854 he formed the Furst & Bradley Co., and in 1885 was elected president of the Machinists' Supply Co.

GEORGE A. CRAGY, former assistant general sales manager of the American Steel & Wire Co. and general sales manager of the National India Rubber Co. wire rope division, died Jan. 3, in Worcester, Mass. Mr. Cragy, who was 57 years old, was a native of Chicago and a member of several clubs in New York and Boston. He was at one time president of the Electrical Manufacturers' Club.

DR. WILLIAM ROBINSON, inventor of the electric spot welding process and various devices, died Jan. 2 in Brooklyn. He was born in Cole Island, County Tyrone, Ireland, in 1840, and had lived in Brooklyn since 1844. In 1878 he organized the Union Electric Signal Co., which he later sold to George Westinghouse and his associates. He invented the semaphore system of closed track circuits for railroads, which the United States Geographical Society classed as one of the epoch-making devices of the century. He also brought out the coaster brake for bicycles, for which he fought in the courts for 20 years before being granted an original patent four years ago. He was a fellow member of the American Institute of Electrical Engineers and an honorary member of the Railway Signal Engineers.

C. E. CLEMENS, for many years sales engineer of the Perfection Spring Co., Cleveland, died at Madison, Ohio, on Dec. 24, after an extended illness. He was well known in the automotive industry and was a member of the Society of Automotive Engineers, in which he served for an extended period on the Spring Standards Committee. Burial was in New York, where Mr. Clemens formerly lived.

The Gas Research Co., Dayton, Ohio, has been incorporated with a capitalization of \$450,000. The company was organized by the directors of the Smith Gas Engineering Co. in order to separate the commercial and experimental business of the company. The new company will continue experiments in connection with gas producer and automotive equipment.

British Steel Exports in November Declined—Imports Large

British steel exports in November, last year, excluding iron ore and including scrap, were 238,896 gross tons, which compare with 277,183 tons in October, with 256,280 tons in September, with 262,676 tons per month in the first quarter, 298,287 tons per month in the second quarter and with 308,459 tons per month in the third quarter. The exports and imports thus far this year are shown by the following table in gross tons:

	Exports	Imports
January	261,248	79,024
February	231,065	71,997
March	295,716	72,491
April	274,337	71,161
May	332,869	83,431
June	287,655	131,476
July	393,016	142,428
August	276,083	92,628
September	256,280	173,838
October	277,183	188,875
November	238,896	158,940

The November export figures were next to the lowest for any month last year. The total exports for the first 11 months have been 3,107,521 tons, or 282,310 tons per month, as compared with 2,028,201 tons to Dec. 1, 1919.

The November imports were 158,940 tons. To Dec. 1 they were 1,339,796 tons, as against 562,851 tons to Dec. 1, 1919.

The following summary gives the relative exports and imports of the first quarter, first half and third quarter of 1919 and 1920, as well as the average per month for 1913 and 1919 in gross tons:

	Exports	Imports
Average first quarter, 1919	147,228	44,713
Average first half, 1919	170,139	37,483
Average third quarter, 1919	180,090	44,514
October, 1919	202,121	88,349
November, 1919	205,263	73,877
Average first quarter, 1920	262,676	74,504
Average first half, 1920	280,481	84,926
Average third quarter, 1920	308,459	136,298
October, 1920	277,183	188,875
November, 1920	238,896	158,940
Average per month, 1913	420,757	195,264
Average per month, 1919	204,516	51,557

The trend of some of the principal exports is shown by the following data in gross tons:

	Av. Per Month, 1913	Av. Per Month, 1919	Nov., 1919	Nov., 1920
Pig iron	78,771	21,503	19,449	10,579
Steel rails	41,676	10,435	16,513	12,588
Steel plates	11,162	19,996	17,651	13,931
Steel bars	20,921	20,787	18,569	25,221
Galvanized sheets	63,506	15,508	22,337	22,046
Tin plates	41,208	24,147	24,498	29,978
Black plates	5,679	11,109	3,982	1,830

The export gains in November, 1920, over November, 1919, and the 1919 monthly average have been in steel bars, galvanized sheets and tin plates. In all the above items the falling off as compared with July, this year, was pronounced.

Pig iron imports in November were 13,384 tons, against 8443 tons in November, 1919. The average per month in 1919 was 13,623 tons, and in 1913 it was 18,059 tons per month.

Iron ore imports in November last year were 350,714 tons, bringing the total to Dec. 1 to 5,972,283 tons, as compared with 4,835,751 tons to Dec. 1, 1919.

Manganese ore imports in December, 1920, were 31,448 tons. These compare with 13,220 tons in November, 1919, and with 50,098 tons per month in all of 1913. The total for the first 11 months of last year was 405,268 tons, against 255,315 tons to Dec. 1, 1919. The average per month in 1919 was 22,150 tons.

Carnegie Steel Co. Annual Dinner

The twenty-fourth annual dinner of the sales and operating officials of the Carnegie Steel Co. was held on the evening of Jan. 8, in the ballroom of William Penn Hotel, Pittsburgh. In accordance with a custom now established, it was strictly a company affair. Former Judge James H. Reed, who is a director of the United States Steel Corporation, was toastmaster. Charles L. Woolridge, superintendent of the Carnegie

Land Co. spoke on "Industrial Housing"; William G. Clyde, vice-president and general manager of sales of the Carnegie Steel Co. on "Selling Problems"; Frank F. Marquard, superintendent of the by-product coke plant at Clairton, Pa., on "Coke—a By-product"; and the subject of Homer D. Williams, president of the company, was "Operating Problems." President James A. Farrell attended.

Decision on Iron Ore Rate

WASHINGTON, Jan. 11.—A forecast of the decision of the Interstate Commerce Commission in the case of the Wharton Steel Co. versus the Pennsylvania and other railroads involving rates on iron ore from Wharton, N. J., and Ringwood, N. J., to Eastern blast furnace destinations is given in a report submitted to the commission by Richard T. Eddy, examiner. The report is in effect the tentative findings of the commission subject to the commission's final approval.

Examiner Eddy recommends that the commission should find:

(1) That the rates on iron ore from Wharton and Ringwood to the Eastern blast furnaces have not been shown to be unreasonable, but are unduly preferential of the ex-lake ores and unduly prejudicial to Ringwood and Wharton;

(2) That the service performed over the so-called Scrub Oak spur by the Wharton & Northern Railroad is not a common carrier service but a plant facility service for the Wharton Steel Co., and in offering to perform the spotting service over that spur without addition to the junction rate the Central Railroad of New Jersey has complied with any legal obligations it may have in the premises.

(3) That the record contains no proof of damage to justify an award of reparation, and reparation should be denied.

Rogers, Brown & Co. Meeting

The annual conference of the members and representatives of the firm of Rogers, Brown & Co. was held in Cincinnati on Jan. 6 and 7. All the members of the firm were present, in addition to the representatives from all the offices of the company. A feeling of optimism was in evidence throughout the sessions. Allan Broome, representing Carl Setterwahl, Stockholm, Sweden, was a guest of the company at the meetings, and gave some interesting information as to the trading possibilities with Norway, Sweden and Denmark. Advantage was taken of the meeting to give a farewell luncheon to Sterling Hubbard, joint manager of the Cleveland office, who has resigned his position and will in future reside in California. Louis Billings, of the Chicago office, has been transferred to the Cleveland office, and will take up his duties immediately. The members of the firm and representatives were the guests at dinner of President Meachem at his home in Bond Hill on the evening of Jan. 6.

The general meeting and business sessions of the district managers and sales engineers of the Pawling & Harnischfeger Co., Milwaukee, will be held at the plant auditorium, Milwaukee, Jan. 25 to 27. A general review of the past years' business will be made and plans for future sales, designs and manufacture in cranes, hoists, excavating machinery and machine tools will be outlined. The meeting will be held under the direction of A. G. Henricks, vice-president and general manager.

As a Christmas present to its employees, James H. Matthews & Co., Pittsburgh, Pa., manufacturers of marking devices and metal signs, presented insurance to all employees rounding out a year or more of service, the plan calling for increased amounts depending on the years of service up to a maximum of five years. About 64 per cent of the personnel benefited by the plan and 21 per cent were given maximum policies. Those with less than one year of service received other presents.

Joseph H. Defrees, president of the Chamber of Commerce of the United States, announces that the ninth annual meeting of the National Chamber will be held at Atlantic City April 27, 28 and 29.

Machinery Markets and News of the Works

MORE INQUIRY

Slightly Improved Demand for Machine Tools in New York

Further Price Reductions Are Noted, One Company Cutting 30 to 40 Per Cent

From all of the leading machine-tool selling centers come reports of more inquiry for tools since the beginning of the year. While buying is still at a low point, the greater interest shown by buyers has created a more hopeful feeling.

A New England manufacturer of grinders and lathes has announced new prices, which compare favorably with those prevailing before the war. The reductions in some instances range from 30 to 40 per cent. A New England manufacturer of precision lathes has reduced prices about 20 per cent. The majority of machine-tool manufacturers, however, hold to their old prices, and state they have no present intention of making reductions.

New York

NEW YORK, Jan. 11.

While there has been a slight increase in the number of inquiries for machine tools since the first of the year, little, if any, improvement in buying is noted. However, the trade has a more hopeful feeling, due to a considerable extent to reports of a turning of the tide in some other industries.

Among the inquiries of the past week is one from the United Tractors Corporation, 1328 Broadway, which has already bought a few machines as initial equipment for a tractor plant at Frankfort, N. Y. The Bryant Electric Co., Bridgeport, Conn., has purchased a few tools. The Standard Oil Co. has purchased several punching machines.

There have been few price reductions so far in the new year. The Rivett Lathe & Grinder Co., Boston, has brought down its prices almost 30 per cent. In making the announcement the company calls attention to the fact that the new prices compare favorably with those in effect in 1914.

The prevailing dullness in the crane market has given way to slight activity in placing orders that have been pending for some time. A few new inquiries for both electric and hand-power cranes have been issued. Among electric crane inquiries, one of the largest is from the M. W. Kellogg Co., Jersey City, N. J., for five overhead traveling cranes. There are two 5-ton, 100-ft. and 53-ft. spans, the latter alternative with a 10-ton, one 20-ton, 61-ft. span and two 40-ton, 61-ft. and 80-ft. spans, the latter alternative with a 20-ton. A locomotive crane inquiry for export to Valparaiso, Chile, has been issued by Wessel, Duval & Co., 25 Broad Street, New York, for two special steam-driven locomotive cranes; one a 200-ton crane for 5-ft. gage track; the other about a 40-ton crane for meter gage track.

Among recent sales are: Champion Engineering Co., two 12-ton, high speed, bucket handling cranes with 5-ton capacity Blaw-Knox Co. buckets and one 25-ton, 53-ft. span power house crane to the Standard Oil Co. of New Jersey for Bayway; the Northern Engineering Works, one 30-ton overhead traveling crane to Guggenheim Brothers for export to Chile; the Milwaukee Crane & Engineering Co., one mono-rail bucket crane with 1½-yd. Blaw-Knox Co. bucket to Henry L. Dougherty & Co., New York, for the Crew, Levick Co., oil refiner, Warren, Pa.; the Shepard Electric Crane & Hoist Co. a 5-ton, 26-ft. span overhead traveling crane to the Arnold Co., Norwalk, Conn.; Chisholm-Moore Mfg. Co., a 1-ton hand power crane to the Jefferson Brass Foundry, Brooklyn, N. Y.

The Telescope Cot Bed Co., 535 East Seventy-ninth Street, New York, manufacturer of metal bedsteads, has taken bids for a new one-story plant at Granville, N. Y., 200 x 300 ft., to cost about \$100,000, including machinery. A power house

The reinstatement of a \$75,000 order which had been canceled created a better feeling in the Cincinnati trade last week. There was also more inquiry in that market, but difficulty is encountered in closing business. The Westinghouse Electric & Mfg. Co. bought a number of tools.

Sales are light in Cleveland, but the demand for single machines has improved since the first of the year. A northern Ohio manufacturer has bought six single-spindle drilling machines.

The increase in the number of inquiries in Boston has created a moderate degree of activity in that market as compared with the dullness which has prevailed in the past few months. A dozen or so tools have been purchased there for shipment to Japan.

There are also signs of slight improvement in Chicago. A few good-sized orders have been placed. There is an inquiry for 20 bench lathes. The Waukesha Motor Co., Waukesha, Wis., is buying used tools.

Philadelphia reports the placement of some good orders, one of which is from the Baldwin Locomotive Works for \$300,000 worth of planers.

In New York there has been a slightly better inquiry but no buying of importance.

will also be constructed. Russell G. Cory, 50 Church Street, is architect and engineer.

The Furman-Fisher Corporation, 30 Church Street, New York, has filed notice of change of name to the Furnam Engineering Corporation.

The Weber Mfg. Co., New York, has been incorporated with a capital of \$300,000 by I. N. Weber, J. P. Coulon and A. L. Jonas, 566 West 191st Street, to manufacture razors and other cutlery.

The Kings County Lighting Co., 4802 New Utrecht Avenue, Brooklyn, will install a new one-story steel coal conveyor system at its plant at First Avenue and Fifty-fifth Street, to cost about \$58,000.

The H. Jackson Pump & Mfg. Co., Brooklyn, has been incorporated with a capital of \$100,000 by L. Unger, O. W. Steinlein and L. W. Schmidt, 408 Wilson Avenue, to manufacture pumping machinery.

A one-story power house, 33 x 35 ft., will be erected at the new factory of Schering & Glatz, 150 Maiden Lane, New York, manufacturers of drugs, at Bloomfield, N. J., estimated to cost about \$100,000. Carl F. Stiefel is president.

The Bennett Flue Blower Co., New York, has been incorporated with a capital of \$250,000 by A. J. Ward, L. F. Halton and G. H. Jett, 206 West Sixty-ninth Street, to manufacture flue cleaning equipment and other power plant specialties.

The Uneeda Pocket Lock Co., New York, has been incorporated with a capital of \$225,000 by D. Weissman, S. N. and R. Reiter, 253 Dumont Avenue, Brooklyn, to manufacture locks and locking devices.

The Peco Mfg. Co., New York, has been incorporated with a capital of \$100,000 by L. M., and H. L. Stierer, 600 West 140th Street, to manufacture typewriter parts and equipment.

The American Spectacle Co., New York, has been incorporated with a capital of \$205,000 by A. F. and S. C. Hirschberg, and B. F. Foster, 30 West Seventieth Street, to manufacture optical products.

The Seaboard & Inland Barge Co., New York, has been formed by a merger of the Inland Barge Co. and the Seaboard Barge Co., with capital of \$1,000,000, to construct barges and other vessels, and operate a general shipbuilding works. The incorporators are M. and J. Tracy, and C. L. O'Connor, 1 Broadway.

The Chelsea Brass & Bronze Foundry Co., 502 West Twenty-fifth Street, New York, has filed notice of dissolution under State laws.

The Bias Buff & Wheel Co., New York, has been incorporated with a capital of \$200,000 by A. W. Browne,

J. G. Lynch and T. A. O'Callaghan, 100 Broadway, to manufacture mechanical specialties.

The Utica Heater Co., Lafayette Street, Utica, N. Y., manufacturer of steam, hot-air and water heaters, has increased its capital from \$250,000 to \$550,000.

A. Fink & Son, Newark, are having plans prepared for a two-story, brick and reinforced-concrete machine shop, 50 x 56 ft., at their packing plant, 810 Frelinghuysen Avenue.

A one-story power plant, 75 x 80 ft., to cost about \$63,000, will be constructed by the Clark Thread Co., Clark and Ogden streets, Newark, N. J., in connection with its new bleaching works at Bloomfield, N. J. Adam H. Groel is general manager.

The National Chemical & Oil Machinery Co., Mount Holly, N. J., has been incorporated with a capital of \$500,000 by Arthur D. Wagner, Emil Eckhardt, Wayne, Pa.; and Henry H. Savage, Mount Holly, to manufacture reduction and other machinery.

The Efficient Electric Protection Co., 30 Kent Street, Newark, N. J., has filed notice of organization to manufacture electric alarm systems and equipment. Frank Silsen, 56 Jefferson Street, heads the company.

The George S. Jephson Co., 24 Sterling Street, East Orange, N. J., manufacturer of automobile bodies, has filed notice of dissolution under State laws. The business will be taken over by the Jephson-Scott Body Co. and operated at the same location. This latter company recently awarded contract for a two and three-story addition, 57 x 53 ft., to cost about \$70,000. John K. Scott is one of the heads of the company.

John Ryle & Sons, Straight Street, Paterson, N. J., manufacturers of silk mill machinery, have increased their capital from \$100,000 to \$400,000.

The New Era Mfg. Co., Newark, has been incorporated with a capital of \$100,000 by Howard R. Lewis, D. Walz and Frank Sepe, to manufacture printing presses and parts. The company is represented by Lintott, Kahrs & Young, 810 Broad Street.

The Connecticut Dynamo & Motor Co., Irvington, N. J., has been incorporated with a capital of \$150,000 by Harry J. Brewer, Gerald Hannay, Lyons Avenue and Woolsey Street, Irvington; and Donald B. Munsick, 786 Broad Street, to manufacture electrical machinery.

The Crown Cork & Seal Co., 1511 Gullford Avenue, Baltimore, manufacturer of bottling machinery, metal bottle caps, etc., has leased property at 57-59 Green Street, Newark, for a new local establishment.

The Newark Brass & Bronze Foundry, Newark, has been organized by Bennett Sanberg and George H. Marshall, 60 Elm Street, to manufacture brass, bronze and other metal castings.

The Tower Mfg. Co., 85 Doremus Avenue, Newark, has filed plans for the erection of a new two-story pulverizing plant, 24 x 40 ft., at its chemical works.

Brown & Zlotnik, 123 Charlton Street, Newark, have filed notice of organization to manufacture automobile bodies. Benjamin Brown, 565 Market Street, heads the company.

The Maples Washington Machine Co., New York, has been incorporated with a capital of \$1,000,000 by R. Lasker, D. H. Lehman and L. Maples, 311 Fifth Avenue, to manufacture electrically operated washing machines and parts.

The recent notice of dissolution of Egleston Brothers & Co., 166 South Street, New York, iron and metal products, was for the purpose of forming a new company of like name with capital of \$2,100,000. The incorporators are E. H. A. J., and J. F. Bragg, Pelham Heights.

The McNab & Harlin Mfg. Co., 55 John Street, New York, manufacturer of brass, steel and iron products, with plant at 440 Straight Street, Paterson, N. J., has increased its capital from \$300,000 to \$900,000. Foster Milliken is president.

The Hudson Motor Car Co., of New York, 1842 Broadway, New York, has increased its capital from \$300,000 to \$1,000,000.

The Utica Fire Apparatus Mfg. Corporation, Utica, N. Y., has filed notice of change of name to the O. J. Childs Co., being merged with the company of this latter name, with plant at 48 Liberty Street devoted to similar line of manufacture.

The Ace Chain Corporation, New York, has been incorporated with a capital of \$350,000 by G. M. Hessler, M. I. St. John and A. W. Palmer, 27 Cedar Street, to manufacture iron and other metal chains, machinery and appliances.

The E. G. Mfg. Co., Inc., 250 West Fifty-fourth Street, New York, manufacturer of automobile parts and equipment, has increased its capital from \$100,000 to \$500,000.

The Texas Co., 17 Battery Place, New York, operating

oil refineries, has filed notice of increase in capital from \$130,000,000 to \$143,000,000.

The Franklin Motor Car Co., 1830 Broadway, New York, has increased its capital from \$100,000 to \$250,000.

The Copp Automobile Body Co., 518 West Fifty-eighth Street, New York, has acquired the new two-story building at Van Alst Avenue and Fourteenth Street, Long Island City, comprising about 45,000 sq. ft. of space, for new works. George W. Copp is head.

New England

BOSTON, Jan. 10.

The outstanding feature of the local machine tool market the past week is a reduction in prices by the Rivett Lathe & Grinder Co., Brighton district, Boston, of 25 to 43 per cent. On plain lathes it is 40 per cent plus, and on precision lathes approximately 30 per cent. The Stark Tool Co., Waltham Mass., precision lathes and tools, has issued a new price list showing a flat reduction of 20 per cent. It announces that no further reduction will be made until June at least.

Since last reports there has been a noticeable increase in tentative inquiries on one or more and, in some cases, moderate sized lists of machine tools. The firms making such inquiries, however, have invariably stated that purchases will not be made except at price reductions. Other large industrial concerns also contemplate purchases provided lower quotations are made.

The local market is by no means stagnant, however. The increase in the number of inquiries, even if subject to a revision in prices, gives a moderately active appearance. In addition, the General Electric Co., West Lynn, Mass., has made purchases against a list of small tools which has been pending for some time and the Jaquith Machinery Bureau, Boston, has purchased a 14-in. x 8 ft. lathe and a 16-in. crank shaper against a fairly large list which includes grinding machinery and drills. A dozen lathes and milling machines have been taken for a Japanese account and negotiations are on for additional lathes for export to that country. About a dozen individual tools, mostly lathes, have been sold by local interests, and a Massachusetts manufacturer has contracted for a 5-ton crane with 60-ft. span.

Prices on at least some makes of chain hoists have been reduced at least 10 per cent. Practically all manufacturers of machinists' vises have lowered quotations 15 per cent and jobbers are now quoting them at 25 per cent discount. Power hack saw blades have been reduced by some leading manufacturers, jobbers now quoting a 40 per cent discount. Bronze bushings for bearings have been reduced 2c. per lb. and one leading manufacturer of steel kits has also reduced prices.

Hackett & Dolittle, Norwalk, Conn., oil cups, have filed a voluntary petition in bankruptcy.

The Baird Machine Co., Stratford, Conn., automatic machinery, has increased its capitalization from \$500,000 to \$1,200,000.

Palmer Brothers Engines, Inc., Greenwich, Conn. marine engines, has increased its capital stock from \$250,000 to \$500,000.

The New York, New Haven & Hartford Railroad Co., is building a one-story addition to its machine shop, Cedar Hill Yard, New Haven, Conn.

The American Engineering Co. and the White Eagle Co., both of New Britain, Conn., have consolidated under the former name with a capital of \$300,000.

The walls of buildings Nos. 2 and 3 and the boiler house at the Greyhound Motors Corporation, East Warren, R. I. plant are up, but work has been discontinued for the present.

The name of the Coe Brass Co., Torrington, Conn., branch of the American Brass Co., has been changed to the Torrington branch. This plant originally was the Wolcottville Brass Co., but in 1863 became the Coe Brass Co. In 1911 it was merged with the American Brass Co.

Part of the wire drawing machinery of the Clinton Wire Works, Clinton, Mass., Wickwire-Spencer Steel Corporation, has been moved to the Palmer, Mass., plant and the remainder will be installed in the near future. No announcement has been made as to what additional equipment, if any, will be installed in the Clinton plant.

Control of William Firth, Inc., Boston, textile machinery and appliances, has been acquired by Joseph J. Smith, treasurer, who has taken over the stock interest in the estate of the late William Firth, who established the business 35 years ago. Mr. Smith has been identified with the concern the past 10 years. The business will be conducted as heretofore.

The Eco Co., Boston, has taken out a Massachusetts

charter to manufacture machine tools, small tools and fixtures. Richard P. Elliott, 41 Hancock Street, Lexington, is president, and Harold C. Elliott, 324 Common Street, Belmont, treasurer. Richard P. Elliott also is president Eco Mfg. Co., Boston, piston rings. The new company is capitalized for \$300,000, divided into 2000 shares of common stock, of which 20 are issued, and 1000 shares of preferred, par in both being \$100.

The Springfield Street Railway Co., Springfield, Mass., is planning to rebuild its machine shop at Palmer, Mass., recently destroyed by fire.

The William P. Kirk Co., Bridgeport, Conn., manufacturer of sheet metal products, has increased its capital from \$50,000 to \$100,000.

The American Machinery & Equipment Co., Newington, Conn., has had plans prepared for the first unit of its proposed plant, a two-story building, 36 x 40 ft. Other structures will be erected later. Marchetti & D'Avino, 721 Main Street, Hartford, Conn., are architects. Martin Pierson is president.

The Trumbull-Vanderpool Electric Mfg. Co., Litchfield, Conn., has increased its capital from \$125,000 to \$200,000.

The Boston & Albany Railroad Co., South Station, Boston, is planning for the immediate erection of a new one-story machine shop, 60 x 95 ft., at Pittsfield, Mass., to cost about \$25,000.

The Bristol Machine Tool Co., Bristol, Conn., has filed notice of dissolution under State laws.

The Bridgeport Screw Co., Bridgeport, Conn., has increased its capital from \$500,000 to \$1,000,000.

The Motor Sales Co., 614 Pleasant Street, New Bedford, Mass., has awarded contracts for the erection of a new service and repair building to cost about \$100,000.

The Wilton Tool & Mfg. Co., 84 Linden Park Street, Roxbury, Mass., will dispose of its entire plant and equipment.

The Springfield Wrapping Machine Co., Springfield, Mass., has been incorporated with a capital of \$50,000 by Herbert L. Handy, Irving S. Russell and James A. Mahoney, 343 Bridge Street, to manufacture special machinery.

Buffalo

BUFFALO, Jan. 10.

The National Lamp Works of the General Electric Co., Fillmore Avenue, Buffalo, has foundation work under way for its new two-story machine shop at 757 East Ferry Street, 84 x 322 ft., estimated to cost about \$120,000. It will be equipped to manufacture precision machinery for lamp manufacture.

The Earl R. Maltby Co., Ellicott Square, Buffalo, N. Y., manufacturer of roofing products, has acquired property on the Walck Road, North Tonawanda, N. Y., for a new one-story factory, 100 x 300 ft.

Stockholders of the Lumen Bearing Co., 1155 Sycamore Street, Buffalo, manufacturer of bronze bearings, etc., have approved an increase in capital from \$200,000 to \$500,000.

Barnes & Irving, 565 South Clinton Street, Syracuse, N. Y., mill supplies, are planning the construction of a new two-story building, 100 x 200 ft., on West Fayette Street, to cost about \$100,000.

The United States Light & Heat Corporation, Niagara Falls, N. Y., manufacturer of electric storage batteries, automobile equipment, etc., has arranged for a stock issue to total \$1,500,000.

The United States Hoffman Machinery Co., 715 West Fayette Street, Syracuse, N. Y., manufacturer of pressing machinery, etc., has awarded a contract to Dawson Brothers, Union Building, for a one-story foundry, 46 x 66 ft., to cost about \$15,000.

The Eberhardt Steel Products Co., 41 Perry Street, Buffalo, has increased its capital from \$25,000 to \$250,000. It recently completed the erection of a new plant, representing an investment of close to \$90,000. C. Eberhardt, Jr., is head.

F. H. Kelly & Co., Inc., Madrid, N. Y., has been incorporated with a capital of \$50,000 by E. G. Brush, L. E. and F. H. Kelly, Madrid, to manufacture agricultural machinery.

The Frontier Water & Steam Supply Co., 485 Washington Street, Buffalo, steam and water piping, faucets, etc., has completed plans for a two-story and basement building at 548 Oak Street, to cost about \$40,000.

The Flexible Couplings Co., Westfield, N. Y., has been incorporated with an active capital of \$35,000 by G. H. Thomas, W. T. and C. E. Welch, Westfield, to manufacture shaft couplings, etc.

The Niagara Metal Stamping Corporation, Niagara Falls, N. Y., has taken over the plant and business of the Niagara Falls Metal Stamping Works. There will be no change other than that of the management.

Catalogs Wanted

C. L. Saunders, purchasing agent Morse Chain Co., Ithaca, N. Y., desires catalogs and prices on machine tools and other factory supplies; also building materials and power house equipment. He also desires quotations from manufacturers of steel bars and sheets.

Philadelphia

PHILADELPHIA, Jan. 10.

There is a more pronounced feeling of optimism in machine tool circles, caused tangibly by the placing of sizable orders by some of the larger concerns. For instance, the Baldwin Locomotive Works has placed an order for special big planers, costing \$300,000; a prominent steel and wire company has bought several large machines, including some heavy duty turret lathes in the Philadelphia district, and the B. F. Goodrich Co. has purchased rubber machinery from the Southwark Foundry & Machine Co.

The Warren Metallic Bedstead Co., Warren, Ohio, has leased a three-story building at Twenty-fourth and Vine streets, Philadelphia, with about 25,000 sq. ft. of floor space, for a new local establishment.

Charles Milgrom & Brother, Inc., Philadelphia, is being organized by Charles Milgrom and associates to manufacture precision machinery and instruments for optical service. Sachs & Sachs, 1432 Real Estate Trust Building, represent the company, and will make application for a State charter on Jan. 24.

The Steel Fittings Co., 2619 Christian Street, Philadelphia, has filed plans for a one-story addition, 32 x 80 ft.

The Freed Heater Co., Collegeville, Pa., manufacturer of stoves, heaters, ranges, etc., has acquired property in the vicinity of Main Street from the Philadelphia & Reading Railroad Co., and is said to be arranging to use a portion of the site for a new plant.

The Kuhn & Jacob Machine & Tool Co., 28 Wood Street, Trenton, N. J., has acquired property, 100 x 100 ft., at Pine Street and Pennsylvania Avenue for a new factory. Plans are being prepared for a machine shop, 35 x 100 ft., to employ about 50 men. It is planned to break ground at an early date.

The Friction & Filtering Cyanide Process Co., Lancaster, Pa., has been incorporated with a capital of \$300,000 by Newman H. Dettrell, A. F. Wilmer and Harry E. Longnecker, Lancaster, to manufacture filtering equipment and mining machinery.

Pittsburgh

PITTSBURGH, Jan. 10.

The Simmons Co., Kenosha, Wis., manufacturer of brass and iron bedsteads, is taking bids for its new two-story building at Pittsburgh, totaling about 23,000 sq. ft. of floor space.

Stuckeman Brothers, Inc., Pittsburgh, is being organized by R. B. Smith, E. C. Speer and E. E. Arrowsmith and associates, to manufacture machinery, engines and other mechanical equipment. Application for a State charter will be made on Jan. 24. The company is represented by Mr. Arrowsmith, 1015 Union Bank Building.

The Zang-Lesher Co., 5472 Pennsylvania Avenue, Pittsburgh, has awarded contract to Toupeit & Conley, Maryland and Ellsworth avenues, for a one-story factory, 75 x 125 ft., on Pennsylvania Avenue, for the manufacture of automobile parts and equipment. It will cost about \$35,000.

The Columbia Steel Shafting Co., Park Building, Pittsburgh, has commissioned I. C. Horn, engineer, 1505 Park Building, to prepare plans for the initial building of its new works at Ambridge, Pa. It will be one and two stories, 600 ft. long, and is estimated to cost in excess of \$500,000 with machinery.

The Electric Auto Signal Co., Wilkinsburg, Pa., has been incorporated with a capital of \$100,000 by B. Hudson, Wilkinsburg; A. J. Henseler, Pittsburgh; and C. R. Blakely, Trafford, Pa., to manufacture electrically operated automobile products.

The Carleton Mining & Power Co., Kingswood, W. Va., recently incorporated, has preliminary plans under way for a new power plant in connection with coal mining operations in this district and for general utility service. Warren P. Miller, D. M. Martin and J. E. Hutchinson head the company.

Fire, Jan. 5, destroyed the automobile and carriage works

of Peter Fisher & Sons, Charleston, W. Va., with loss estimated at about \$50,000.

The Fordlette Engine Co., Huntington, W. Va., has been incorporated with a capital of \$100,000 by E. G. Livesay, E. C. Wilson and L. K. Smith, all of Huntington, to manufacture automobile engines.

The J. C. Boggs Motor & Light Co., Greenbrier, W. Va., has been incorporated with a capital of \$50,000 by J. C. Boggs, W. C. Hobbs and L. J. Richmond, Lewisburg, W. Va., to manufacture electrical equipment.

Cincinnati

CINCINNATI, Jan. 10.

Some machine tool manufacturers report more inquiries the past week, but difficulty is being experienced in closing the business. That advantage is being taken of the slack period by some industries to get their equipment in first class condition, is evidenced by a number of orders placed with local manufacturers recently for single tools. Some scattered railroad buying is also reported, although no action has been taken on the large lists issued several weeks ago. The Westinghouse Electric & Mfg. Co., purchased a number of tools in this market last week and a cancellation, involving about \$75,000 worth of tools, has been reinstated. No new lists are reported. Some machine tool plants contiguous to the Cincinnati district have been closed for a few weeks, but in the majority of cases, shorter hours are being worked with the full staff employed. Railroads operating shops in this district have reduced forces approximately 25 per cent. It is said that these shops were over-manned during the war and that their efficiency had suffered while under Government control. In one instance at least, laying off of half the crew in one department of a railroad shop, has not lessened the production more than 10 per cent. While this is not typical of all machine shops, greater efficiency is noted in shops where day work is being done. No wage cuts in the machine tool industry are announced, though a textile mill in this district has reduced the wages of machinists 10 per cent, even greater reductions taking place in other departments of the plant.

The J. H. Day Co., Cincinnati, manufacturer of bread making machinery, has purchased additional property, 129 x 145 feet, adjoining its plant on Harrison and Colerain avenues, and storage warehouses will be built in the near future.

The National Automatic Tool Co., Richmond, Ind., is remodeling portions of its plant with a view to greater efficiency in the manufacture of drilling machines.

The Post-Glover Electric Co., Cincinnati, manufacturer of electrical specialties, will increase its capitalization from \$120,000 to \$720,000.

Chicago

CHICAGO, Jan. 10.

Conditions in the machine tool trade are still exceptionally quiet, but show signs of a slight improvement. There has been more shopping among local stores and sales, though few and far between, are greater than during the holidays. Here and there a few good-sized orders have been taken. An Aurora, Ill., plant bought a 16-in. horizontal boring mill and another user purchased a 20-in. x 8 ft. 10-in. engine lathe. A current inquiry calls for 20 bench lathes which, with complete equipment, will involve an outlay of about \$10,000. Further information regarding recent purchases by the Waukesha Motor Co. indicates that three turret lathes, one keyseating machine, three drilling machines and some second-hand tools were bought, and that the company is in the market for additional used machinery.

For the time being railroad buying has stopped, but it is expected that the matter of authorizing an appropriation for the Albuquerque, N. M., shop equipment will soon be acted upon by the board of the Santa Fe. The Illinois Central will ask for new figures on a list of tools some time in March, according to the latest reports from that road.

The Illiam Malleable Iron Co., 1650-58 Wolfram Street, Chicago, has let contract for the construction of a four-story power plant, 90 x 96 ft., to cost \$150,000.

John E. Hagquist, tool manufacturer, 1325 West Fifty-ninth Street, Chicago, has let contracts for a one-story factory, 32 x 60 ft., to cost \$15,000.

The plant of the Edward Valve & Mfg. Co., East Chicago, Ind., was damaged by fire on Jan. 5, with an estimated loss of between \$300,000 and \$400,000. It manufactures washing machines, bolts and nuts, and other metal products.

The American Locomotive Co., New York, has acquired 205 acres in Granite City, Ill., as the site for a proposed \$5,000,000 plant.

The Keith Furnace Co., Des Moines, Iowa, is having plans prepared for a new plant at East Twenty-first Street and Dean Avenue, which it expects to complete in part, if not all, by Jan. 1, 1922. It will be equipped to manufacture warm air furnaces and accessories. The Charles C. Kavin Co., Chicago, is working on plans for the foundry unit.

The Wood & Safford Machine Works, Great Falls, Mont., manufacturer of cylinder grinding and boring bars, adaptable to any lathe spindle, and a face plate for holding the cylinder for regrinding, will carry on the entire manufacture of its devices in its own plant. Heretofore castings have been made for the company at Rockford, Ill.

The Interstate Foundry Co., Cleveland, has purchased the plant of the Standard Steel Castings Co., covering six and one-half acres at Austin Avenue and Sixty-fifth Street, Chicago. It includes a foundry, machine shop, assembling room and core room, all relatively new and representing an investment of \$320,000.

The S. G. Hunter Bridge & Iron Works, Sioux Falls, S. D., is having plans prepared for an assembling building.

The Woodrow Nipple Co., 1313 North Wood Street, Chicago, manufacturer of nipples, pipe fittings, etc., is taking bids for a new one-story plant on Spaulding Avenue, 60 x 125 ft., to cost about \$25,000.

The Franklin Pipe & Foundry Co., Chicago, has filed notice of dissolution under State laws.

The Marquette Tool & Mfg. Co., Chicago, has increased its capital from a nominal amount of \$5,000 to \$130,000.

Altorfer Brothers, Inc., Peoria, Ill., manufacturer of washing machinery, has increased its capital from \$400,000 to \$3,000,000.

The Streeter-Amet Weighing & Recording Co., 4101 Ravenswood Avenue, Chicago, has increased its capital from \$125,000 to \$250,000.

The Great Northern Railway, East Fourth Street, St. Paul, Minn., has plans under way for new locomotive repair shops at Minot, N. D., to cost about \$100,000. A. H. Hogleland is chief engineer.

The Cataract Pump Co., 5648 Harper Avenue, Chicago, has been incorporated with a capital of \$30,000 by Irving Klein, J. M. Swannstrom and J. B. Loewenstein.

Cleveland

CLEVELAND, Jan. 10.

Although sales continue very light, some dealers report that the demand for single machines has improved slightly since the first of the year. Buyers who inquired for machinery the latter part of last year and later decided to defer purchases until January have as yet not revived their inquiries, but dealers hardly expected that any of this business would develop so early in the month and have hopes that some of it will be placed soon. A northern Ohio manufacturer has just placed an order with a local manufacturer for six single spindle drilling machines.

No further price reductions are reported in this section, but the trade has been advised of a 20 per cent cut by the Stark Tool Co., Waltham, Mass. on its line of precision lathes.

Many industrial plants which were closed during the holidays resumed operations last week at about the same capacity as before the holiday shut down.

The Continental Gin Co., Birmingham, Ala., manufacturers of cotton gins, has placed a contract with the H. K. Ferguson Co., Cleveland, for a machine shop, 100 x 300 ft., one story of brick, steel and concrete, and a two-story foundry, 130 x 342 ft., of reinforced concrete construction. The machine shop will be equipped for both light and heavy work.

The Highways Engine Co., Defiance, Ohio, recently incorporated with a capital stock of \$1,500,000, expects to begin the erection of a plant in the spring for the manufacture of truck and tractor engines. Charles H. Kettenring, president Defiance Machine Works, is also president of the engine company.

The Gridiron Gripp Wheel Co., Toledo, Ohio, has been incorporated with a capital stock of \$150,000 and has purchased a site on the New York Central Railroad tracks in East Toledo, on which it has commenced the erection of a plant for the manufacture of tractor wheels. Its offices at present are in the Nicholas Building.

The Par Brook Mfg. Co., Brook Park Road, Cleveland, plans to erect an addition, 60 x 150 ft. G. S. Rider & Co. are the architects.

The plant of the Canton Auto Parts Co., Canton, Ohio, which was recently placed in the hands of George W. Perks as receiver, has been ordered by the court to be offered for sale as a whole on Jan. 22.

One End of the Machine Shop, Building No. 42, Boston Navy Yard. Here may be seen a reversing motor driven planer 16 ft. wide and 14 ft. high with a 40-ft. bed; a 20-ft. boring mill; a 96-in. x 24-ft. planer; a 120-in. crankshaft lathe; an 8-ft. bar floor boring or horizontal boring, drilling and milling machine; and a 60-in. x 70-ft. lathe. The shop contains many other large machines. For instance, in the bay at the right there are one 100-in., one 84-in. and one 53-in. boring mills and about half a dozen other large tools, many of them the product of the Niles-Bement-Pond Co.



Milwaukee

MILWAUKEE, Jan. 10.

Encouragement is lent to the local machine tool trade by a resumption of inquiry, but it is such that makers and sellers are confronted by a growing necessity of reducing prices in order to close transactions. New business is still being placed sparingly. The renewing of operations on at least a partial scale by some metal-working industries in this district, which have been practically idle, and extension of production by others which have been running slack, is regarded as favorable. However, some industries which intended to resume Jan. 3 have postponed this until Feb. 1.

The Baraboo Mfg. Co., Baraboo, Wis., has been incorporated with a capital stock of \$100,000 to manufacture patented, electrically-operated refrigerating units for domestic and commercial use. The former Ruhland Brewing Co.'s plant has been leased and will be remodeled and equipped as a machine shop. L. S. Wright, 1302 Majestic Building, Milwaukee, is promoting the enterprise in association with W. M. Ott, George Isenberg, George W. Andrews, and Ferdinand Effinger of Baraboo.

The Madison Tool & Stamping Works, Madison, Wis., which recently increased its capital stock from \$10,000 to \$25,000, will build a one-story brick machine shop, 50 x 100 ft., estimated to cost about \$20,000 and to be ready about March 1. Lorenz Maisel is vice-president and works manager.

The Liberty Machine Co. of Wauwatosa, Wis., has been chartered to manufacture metal products, principally electric and gas lighting fixtures. The capital stock is \$10,000 and the incorporators are William J. Grede, A. E. Stroud and Jeremiah Keeler.

The Washkosh Mfg. Co., Oshkosh, Wis., manufacturer of domestic washing machines, contemplates the erection of a new factory or as an alternative, an addition to the present plant early in the spring. During 1920 the capacity was enlarged by a main shop addition, 60 x 100 ft.; the acquisition of the former Mathieson boat factory, 50 x 60 ft., and leasing one floor of the Starkweather plant, 60 x 100 ft. At present the factory is working two to three nights a week to fill orders. J. E. Bolduc is president and R. E. Russey, general manager.

The Clarkson Coal & Dock Co., Superior, Wis., is taking bids for the erection and equipment of a two-story brick machine and service shop, 55 x 160 ft., to cost about \$50,000. The architect is R. E. Buck, Superior. J. J. Davidson is general superintendent.

The Board of Education, Chippewa Falls, Wis., will take bids Feb. 15 for a three-story brick and concrete junior high and vocational training school, 100 x 175 ft., estimated to cost \$200,000. The architects are Beers, Schlitz & Bailey,

53 West Jackson Boulevard, Chicago. J. J. Farrell is secretary of the board.

The Young-Fischer Inclinator Co., Milwaukee, has been chartered to manufacture a patented device for measuring angles of inclination and declination and other similar instruments. The incorporators are Walter Fischer, Mabel A. Young and H. W. Young, 114 Grand Avenue.

The Winther Motor Co., the Marwin Motor Truck Corporation and the Kenosha Wheel & Axle Co., affiliated corporations of Kenosha, Wis., have resumed work in tool rooms and will open manufacturing departments the latter part of the month to handle a \$3,000,000 order for trucks from the Government. The order calls for 300 1½-ton and 75 3-ton quadruple drive trucks, delivery to be completed by Aug. 1.

The Kahlenberg Bros. Co., Two Rivers, Wis., is working on a number of important orders for foreign delivery. A large oil engine for marine purposes was shipped to China and a number of engines of similar type are in process for shipment to Alaska and Cuba. The company has increased its capitalization from \$75,000 to \$300,000 to accommodate its business expansion.

The Antigo Tractor Co., Antigo, Wis., has been reincorporated as the Antigo Tractor Corporation, with an authorized capitalization of \$1,000,000, or twice the capital of the original concern. It recently purchased the foundry and machine shop of the Murray-Mylrea Co., Antigo, and is now starting quantity production of four-wheel-drive tractors. W. L. Carver, formerly of the Mid-West Engine Co., Indianapolis, is general manager.

Indiana

INDIANAPOLIS, Jan. 10.

The Block Tire & Rubber Co., 708 South Sixth Street, Terre Haute, Ind., has awarded contract to the Mayrose Contracting Co., Terre Haute, for the first unit of its new plant, two stories, 80 x 200 ft., and estimated to cost about \$100,000. George E. N. Jones is president.

The Indiana Oil Refining Co., Columbus, Ind., is considering plans for a new refinery near the southern city limits, estimated to cost about \$350,000. The main structure will be one and two stories, 50 x 100 ft. O. L. Bartlett is president.

The Tippecanoe Power Co., Indianapolis, is being organized with a capital of \$3,000,000 by H. E. Kinney, head of the H. E. Kinney Grain Co., and associates, to construct a new hydroelectric generating plant on the Tippecanoe River. Preliminary plans are being prepared, and it is proposed to commence construction early in the spring. John A. Shafer, Indianapolis, is engineer.

The Interstate Public Service Co., Scottsburg, Ind., is

preparing plans and will call for bids early in March for the erection of its new car shop, estimated to cost about \$200,000, with machinery. H. H. Buckman is in charge.

The Central Wire & Iron Works, Indianapolis, has increased its capital stock from \$5,000 to \$25,000.

The McCray Refrigerator Co., Kendallville, Ind., has increased its capital stock from \$50,000 to \$1,000,000. Additional machinery will be installed in the cement mill of the Louisville Cement Co., Speed, Ind., to increase its daily capacity from 1000 to 2000 bbl.

The Simplex Lock Rim Co., Petersburg, Ind., will manufacture an automobile luggage carrier, the invention of John M. Loveless of that city.

The Parrish-Alford Fence & Machine Co., Knightstown, Ind., has increased its capital stock from \$75,000 to \$300,000.

The Huntington Steel Foundry Co., Huntington, Ind., has changed its name to Armstrong Steel Casting Co.

The Wanner Malleable Iron Co., Hammond, Ind., has increased its capital stock from \$150,000 to \$450,000.

The Sheet Metal Specialty Co., Goshen, Ind., has changed its name to the American Mfg. & Engineering Co.

Detroit

DETROIT, Jan. 10.

The machine tool market continues dull, with only a few single orders listed, although inquiries appear to be looking up a little. The better prospects are believed to be due to the fact that many automotive factories will reopen at least some of their departments within the next week or so.

The Zenith Foundry Co., Miller Avenue, Detroit, has let contract for an addition to its plant, one-story, 90 x 200 ft.

The Brayer & Lundblad Foundry Co., South Haven, Mich., has changed its name to the Lundblad Foundry Co.

The Keeler Brass Co., Grand Rapids, Mich., has increased its capital from \$250,000 to \$1,000,000.

J. C. Widman & Co., Fifteenth Street and Kirby Avenue, Detroit, manufacturers of automobile equipment, have increased their capital from \$250,000 to \$350,000.

The Allington & Curtis Co., Saginaw, Mich., manufacturer of dust collecting equipment, air conveyor apparatus, etc., has completed the enlargement of the local plant of the Wilcox Engineering Co., recently acquired, and will remove to the new location at once.

The Oliver Machinery Co., Grand Rapids, Mich., has increased its capital from \$210,000 to \$850,000.

The Horvath-Arndt Mfg. Co., Detroit, manufacturer of automatic oiling and lubricating devices, is contemplating the establishment of a new plant at Brighton, Mich. It will temporarily occupy space in a building of the Gove Motor Car Co., and it is said that later a new factory will be erected on a neighboring site.

The West Michigan Tool Co., Ltd., Grand Rapids, Mich., has changed its name to the Pulte-Korreck Machine Co. F. E. Pulte is president.

The Barley Motor Car Co., Kalamazoo, Mich., has changed its name to Roamer Motor Car Co. It manufactures Roamer automobiles and is capitalized at \$2,500,000.

The Reed Foundry & Machine Co., Kalamazoo, Mich., is planning two new buildings and additions to those in existence, to provide facilities for manufacturing a newly developed gasoline and kerosene engine for Reed tractors. Construction will start in the early spring.

Baltimore

BALTIMORE, Jan. 10.

The Wizard Check Endorser & Printing Machine Co., Inc., 457 Calvert Building, is about to take bids for its plant at Orangeville, Baltimore, to cost between \$500,000 and \$600,000. Plans are being prepared by Frederic A. Fletcher, architect, 401 North Charles Street. At a meeting of stockholders the following officers were elected: F. S. Weise, president; R. Norman Cadle, vice-president, and John H. Hessey, secretary and treasurer. The Board of Directors consists of the officers and J. Norris McFarland and George A. Wilson.

The Standard Chilled Castings Corporation, Lynchburg, Va., will establish a plant for the manufacture of plow parts and general castings. J. L. Thomas is secretary.

J. E. Bernard, Roanoke, Va., will build a one-story machine shop to cost \$5,000.

The Imperial Elevator & Engineering Co., 403-5 South Caroline Street, Baltimore, has been incorporated with a

capital of \$25,000 by L. Clifton Perkins, William D. Roycroft and F. S. Nichols, to manufacture elevators and conveyors.

The National Oil Co., Inc., Keyser Building, Baltimore, has acquired additional property in the vicinity of its works at Bank and Eighth streets, Canton, for the erection of its proposed refinery.

The Phillip Kell Co., Inc., Holiday and Center streets, Baltimore, manufacturer of sheet metal products, will take bids in April for its new one and two-story plant, 70 x 165 ft., estimated to cost about \$45,000.

The Georgia-Republic Co., Macon, Ga., has been incorporated with a capital of \$50,000 by J. L. Soyars, T. E. Turner and R. M. Yaffin, Macon, to manufacture automobile truck parts.

The Virginian Drinking Equipment Co., Lynchburg, Va., has been incorporated with a capital of \$50,000 by J. P. Robertson, Lynchburg; Dean S. House and Jefferson R. Palmer, Charlotte, N. C., to manufacture drinking fountains and other metal drinking equipment.

The Universal Automobile Co., Winston-Salem, N. C., manufacture of automobile equipment, has increased its capital from \$125,000 to \$500,000.

The Gulf States

BIRMINGHAM, Jan. 10.

The Merrill-Stevens Shipbuilding Corporation, Jacksonville, Fla., is planning for additions and improvements at the shipyard of A. Bentley & Sons, recently acquired, to cost about \$400,000 with equipment. J. E. Merrill is vice-president and general manager.

The Ula White Way Post Co., Tampa, Fla., recently incorporated with a capital of \$50,000, is planning for the installation of equipment in a local building to manufacture metal and concrete-reinforced posts, etc. William G. Fulton is president and manager; E. F. Clifford, secretary and treasurer.

The Humphreys-Mexia Co., Mexia, Tex., recently incorporated with a capital of \$2,500,000, has acquired about 300 acres and plans the erection of a refinery.

The Clisco & Northeastern Railroad Co., Cisco, Tex., is considering the erection of a new car and engine repair works.

The Delhart Hardware Co., Delhart, Tex., has been incorporated with a capital of \$75,000 by A. P. and H. B. Thompson and J. N. Riggs, Delhart, to manufacture hardware and other metal products.

The Electric Sun Co., Miami, Fla., has been incorporated with a capital of \$220,000 to manufacture electrically operated display signs. It will be affiliated with the organization of the same name at Asbury Park, N. J., where headquarters are maintained. The incorporators, all of Asbury Park, are Charles D. Winters, Kays R. Morgan and William J. Van Vleck.

The American Well & Prospecting Co., Corsicana, Tex., is considering the erection of a new one-story machine shop.

The Gulf Refining Co., Dallas, Tex., has completed plans for the erection of one and two-story extensions to its plant to cost about \$150,000.

The Central Texas Pipe Co., Brownwood, Tex., recently incorporated with a capital of \$1,000,000, will operate a local plant for the manufacture of sanitary burned clay pipe for water and other service. The company is headed by H. H. Barrett and W. A. Letson, Brownwood.

A. J. Davis, Bristol, Tex., is planning to rebuild his cotton gin recently destroyed by fire with loss estimated at about \$35,000.

The Transcontinental Petroleum Co., Tampico, Mexico, will build an oil pumping station in the Amatlan field, consisting of 12 pumps and a battery of 28 boilers. The plant will have a daily capacity of 250,000 bbl. of crude oil.

D. Souter, 647 St. Mary Street, Baton Rouge, La., is organizing a company to manufacture a fire hose holder, an automatic releasing fire hose device, a pipe flange and a high-pressure flange union for large diameter oil pipe lines. Other metal products will be manufactured, but no definite plans have been made beyond the four products mentioned. Makers of steel and malleable iron castings are invited by Mr. Souter to send information and prices. He also desires catalogs and prices on special machinery for making wire shapes.

The Gulf Machinery & Investment Co., New Orleans, is in the market for a 15-in. hydraulic dredge, to be used in tributaries to the Gulf of Mexico.

The Central South

ST. LOUIS, Jan. 10.

The American Locomotive Co., 30 Church Street, New York, has preliminary plans under way for new works at St. Louis and has secured options on about 250 acres in the vicinity of the works of the American Car & Foundry Co. and the St. Louis Coke & Chemical Co. It is estimated to cost at least \$5,000,000 for initial buildings and machinery.

The Eclipse Electric Machine Co., 660 Second Street, St. Louis, has awarded contract to A. Markham & Co., 4325 Floyd Street, for a new one-story and basement factory on Thirty-first Street, 56 x 150 ft., to cost about \$17,000.

The Wood-Evertz Stove Co., Springfield, Mo., has increased its capital from \$200,000 to \$300,000.

The Sunshine Safety Lamp Co., 1005 McGee Street, Kansas City, Mo., has awarded a contract to John Gosling, Railway Exchange Building, for its one-story and basement plant, 50 x 115 ft., on Walnut Street. W. H. Hoffstot is head.

The Casmor Hardware Co., Pawhuska, Okla., has been incorporated with a capital of \$100,000 by B. T. Caspari, R. J. Morrow and F. G. Hetsel, Pawhuska, to manufacture metal products and hardware.

Fire, Jan. 3, destroyed a portion of the general repair shop, known as Building B, at the plant of the United Railways, Delmar and De Balviere avenues, St. Louis, with loss estimated in excess of \$200,000, including equipment and rolling stock.

The B. & O. Machine & Foundry Co., Tulsa, Okla., has increased its capital to \$75,000.

The Louisville & Nashville Railroad, Louisville, has preliminary plans under way for a one-story repair shop at Etowah, Tenn., to replace the structure recently destroyed by fire. J. C. Haley, Louisville & Nashville Building, Louisville, is company architect.

The Automatic Self-Leveling Clock Co., Kirksville, Mo., has been incorporated with a capital of \$350,000 by J. T. Dodson and J. A. Pixier, Kirksville, and C. W. Custer, Greencastle, Mo., to manufacture clock mechanisms and special clocks.

The Keystone Driller Co., Joplin, Mo., will build an addition at a cost of about \$50,000.

The Chester Iron & Foundry Co., E. A. Linnin, president, St. Louis, will erect a foundry addition and a power plant.

The Patterson Steel Co., Tulsa, Okla., Alfred B. Patterson and others interested, will equip a foundry and steel plant requiring about \$50,000 worth of machinery.

The Bradford Tank Co., Tulsa, Okla., will equip a plant with about \$50,000 worth of machinery.

The Ash Grove Lime & Portland Cement Co., Ash Grove, Mo., will rebuild its burned machine shop. It will also improve the main plant and install additional crushers and other equipment.

The Stamps Ice & Fuel Co., Little Rock, Ark., is in the market for about \$40,000 worth of ice-making equipment.

The Brecht Co., St. Louis, will erect a two-story addition, 75 x 75 ft., for the manufacture of butchers' supplies.

California

LOS ANGELES, Jan. 4.

The Consolidated Vanadium Co., 1225 Washington Building, Los Angeles, has awarded contract to the Union Iron Works, Los Angeles, for a one-story plant, 50 x 50 ft., at 2485 Hunter Street.

Fire, Jan. 6, destroyed the plant of the Otis Elevator Co., Beach Street, San Francisco, with loss estimated in excess of \$500,000, including equipment.

The Martin Coin Wrapping Machine Co., Los Angeles, has been incorporated with a capital of \$50,000 by C. E. Martin, A. W. Young, and Fred Johnson, to manufacture special machinery. It is represented by Cooper, Collings & Shreve, 708 Washington Building.

The Barnett Auto Body Co., 1230 South Main Street, Los Angeles, has filed notice of organization to manufacture automobile bodies. O. W. Dolph, 4915 Fourth Avenue, heads the company.

The new plant of the Shartzer Illuminated License Plate Co., Oakland, Cal., to be located on the waterfront between Eighteenth and Nineteenth Avenues, will be constructed by day labor, and erection will commence at an early date. Three factory buildings will be constructed, each 40 x 120 ft., with office, 35 x 54 ft., and one-story warehouse, 50 x 200 ft.,

estimated to cost \$60,000. Edward Demar, 2700 Webster Street, Berkeley, Cal., is architect.

The Price Machine & Electric Works, 115 West Pico Street, Los Angeles, has filed notice of organization to manufacture machine parts and electrical products. Morris Price, 4323 South Olive Street, heads the company.

The Jackson Iron Works, Los Angeles, has acquired about two acres of land at Slauson and Boyle Avenues, and contemplates the erection of a new plant.

The Paramount Electric Fixture Co., 6278 Hollywood Boulevard, Los Angeles, has filed notice of organization to manufacture metal electric lighting fixtures. J. J. Strauss, 5737 Virginia Avenue, heads the company.

The Estate of George C. Biddle, San Francisco, has had plans prepared for a one-story machine shop at Turk and Hyde streets. M. I. Schwartz, Nevada Bank Building, is architect.

The Boyle Mfg. Co., Fifty-first Street and Santa Fe Avenue, Los Angeles, manufacturer of tanks, etc., has acquired about four acres in the vicinity of its works, and plans the erection of a number of additions.

The Southern California Edison Co., Los Angeles, has developed a 15-year program of hydroelectric power plant construction on the San Joaquin River and Big Creek in the Sierra National Forest district which calls for an expenditure of \$200,000,000. Preliminary work has begun.

Canada

TORONTO, Jan. 10.

The National Castings, Ltd., Belleville, Ont., will start work in the near future on the erection of a foundry.

The Electric Foundries, Ltd., Tudhope Knox Building, Orillia, Ont., will build a new foundry at a cost of \$20,000.

The Imperial Pipe Line, Toronto, contemplates the construction of pipe lines from Peace River to Fort Norman at a cost of about \$50,000,000.

The Ontario Portland Cement Co., Brantford, Ont., has started construction on its plant at Beachville, Ont.

The Madawaska Light & Power Co., St. John, N. B., is having plans prepared for a power plant on Green River to develop from 2000 to 2500 hp. Construction will start in the spring.

During the past year the Canada Iron Foundries, St. Thomas, Ont., has spent approximately \$150,000 extending its plant and proposes to make further additions this year.

The Chatham Malleable & Steel Co., Chatham, Ont., is building an addition to its plant which will practically double the present capacity. Equipment for the manufacture of automobile accessories will be installed.

The Canada Ingot Iron & Culvert Co., Guelph, Ont., is building two new factories, 48 x 290 ft., and 120 x 132 ft., respectively.

The International Malleable Iron Co., Guelph, Ont., recently acquired a site of 12½ acres on which it will erect a drop forge foundry and make other additions to its plant.

The Seaman Kent Co., Ltd., 268 Wallace Avenue, Toronto, is in the market for a 1000-gal fire underwriters' pump, also a 50-hp. motor, 25-cycle three-phase 550 volts, about 720 r.p.m.

L. G. Harris & Co., 1601 Royal Bank Building, Toronto, will purchase a 5-hp. steam engine and a 3 to 5-kw. direct current generator, 110 volts, arranged for belt drive.

H. E. R. Barnes, town engineer, Town Hall, Dartmouth, N. S., will receive bids until Jan. 16, for a portable stone crusher outfit; equipment to include gasoline engine, crusher, elevator, etc., complete with belting; capacity 30 to 50 tons per day; total weight of the machine not to exceed 4 tons.

The Draper Mfg. Co. of Canada, Ltd., Petrolia, Ont., has been incorporated with a capital stock of \$50,000 by Bloss P. Corey, Kenneth C. Kerr, Petrolia, Ont.; James F. Draper and John M. Gleason, both of Port Huron, Mich., to manufacture tools, valves, machinery, etc.

The Turnbull Elevator Co., Ltd., Toronto, has been incorporated with a capital stock of \$1,000,000 by John H. Turnbull, Alexander R. Cochrane and others to take over the plant and business now carried on by the Turnbull Elevator Mfg. Co., 126 John Street.

The Canadian Top & Body Corporation, Ltd., Tilbury, Ont., has been incorporated with a capital stock of \$250,000 by Louis L. Odette of Sandwich, Ont.; Wilfred C. LaMarch, Ivan B. Craig and others of Chatham, Ont., to manufacture automobile and motor truck tops, bodies, etc.

IRON AND INDUSTRIAL STOCKS

Securities, Like Many Commodities, Have Been Thoroughly Liquidated

The course of prices for securities during the past week, when contrasted with that during the latter part of 1920, indicates that iron and industrial stocks, like many commodities, have been thoroughly liquidated. Another encouraging feature is the pronounced improvement in prices for Government, railroad, industrial and steel bonds, based on a broader demand for them. Such buying always has foreshadowed an improvement in our industrial situation. The recovery in values for stocks, however, has been as rapid as was the decline which culminated in the closing days of 1920, largely because of technical stock market conditions. For that reason financial students anticipate some irregularity in market quotations within the near future. But they as well as banking and industrial leaders are confident that the worst in industrial conditions is behind us.

Motors and steels so far have led the recovery, with Stromberg Carbureter and Crucible Steel the leaders in their respective groups. A conspicuous feature of recent trading on the New York Stock Exchange has been the odd-lot buying of United States Steel common, which has been on a much larger scale than previously noted in any January in recent years. This would indicate investment buying and a new high record in the number of stockholders in that company. Rails have joined in the recovery, but not to the same extent as motors and steels. There also has been an improved market for copper shares, based, it is said, on an indicated increased consumption of the red metal and higher prices.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chal. com...	29 3/4 - 34 3/4	Int. Har. com...	93 3/4 - 97
Allis-Chal. pf...	75 1/8 - 76 3/4	Int. Har. pf....	103 - 105
Am. Can com...	25 - 28 1/4	Lack. Steel	52 1/2 - 55 1/4
Am. Can pf....	77 1/4 - 83 1/2	Lake Sup. Corp..	7 3/4 - 9 3/4
Am. C. & F. com...	120 - 126 1/4	Midvale Steel....	31 - 33 1/2
Am. C. & F. pf....	110	Nat.-Acme	27 - 30
Am. Loco. com...	81 1/2 - 85 1/4	Nat. E. & S. com.	49 3/4 - 51 1/2
Am. Loco. pf....	100 - 102 1/4	N. Y. Air Brake	79 1/2 - 80
Am. Rad. com...	66 3/4 - 68 3/4	Nova Scotia Stl.	31 - 36
Am. Stl. F. com.	30 - 31	Pressed Stl. com.	81 1/4 - 85
Am. Stl. F. pf...	85 - 86	Ry. Stl. Spg. com.	82 - 86
Bald. Loco. com.	84 - 91 1/2	Ry. Stl. Spg. pf.	100
Bald. Loco. pf...	100	Replogle Steel ..	34 - 37 1/2
Beth Steel com...	53 - 55 1/4	Republic com. . .	60 3/4 - 66 3/4
Beth. Stl. Cl. B..	54 1/2 - 58 3/4	Republic pf.	89 1/2
Beth. Stl. 8% pf.	99 3/4 - 102 1/2	Sloss com.	50 3/4 - 52 3/4
Case, J. I., pf....	77 - 81 1/2	Superior Steel ..	43 - 45
Chic. Pneu. Tool	60 - 65	Trans.-Williams..	39
Colo. Fuel	27 - 30	Un. Alloy Steel..	31 - 34
Cruc. Steel com...	73 - 90	U. S. Pipe com...	11 1/2 - 11 3/4
Cruc. Steel pf...	83 1/2 - 86	U. S. Pipe pf....	39 1/4 - 40 1/4
Gen. Electric ...	120 3/4 - 121 3/4	U. S. Steel com...	80 1/2 - 83 3/4
Gt. No. Ore Cert.	28 3/4 - 29 3/4	U. S. Steel pf....	107 - 109 3/4
Gulf States Steel	28 1/2 - 34	Vanadium Steel..	32 1/4 - 37 1/4
		Westghouse Elec.	42 3/4 - 45 1/4

Dividends

The Truscon Steel Co., Youngstown, Ohio, has declared the regular quarterly dividend of 4 per cent. on the common stock, payable Jan. 15 to holders of record Jan. 5.

Directors of Ohio Iron & Steel Co., a holding concern, of Youngstown, Ohio, have declared the regular dividend of one per cent a month and one per cent extra for 1921, the same rate as was paid in 1920.

Industrial Finances

The Penn Steel & Iron Corporation, Lancaster, Pa., went into receivers' hands on Jan. 7. Its assets aggregate \$384,000 and its liabilities \$327,367. It makes muck bar, merchant bar iron and boat spikes. Work has been suspended at its mills during the last eight months on account of a wage strike.

W. E. Wider, Elkhart, Ind., has been appointed receiver for the Harry A. Smith Typewriter Co., of that city, on petition of Frederick T. Becker, superintendent. The receiver's bond was set at \$100,000. The company's business has been affected by the high rate of exchange, as its trade was almost all with foreign countries.

Directors of the Midvale Steel & Ordnance Co. last week declared a quarterly dividend of 50c. a share, compared with \$1 a share declared three months ago. In 1917 the Midvale company paid dividends of \$6 a share, in 1918 the same, and in 1919 \$3.50 a share.

Alexander B. Campbell and Daniel Waldo Lincoln, Worcester, Mass., attorneys, and George H. Gibby, Boston, have been appointed receivers of the Massachusetts Oilless Bearings Co., Burnside Court, Worcester.

The Laconia Car Co., Laconia, N. H., has reduced the par value of its common stock from \$100 to \$50, thereby reducing its capitalization from \$2,000,000 to \$1,500,000, consisting of 10,000 shares of common, and 10,000 shares of preferred stock, the par of the latter being \$100.

The Wyman-Gordon Co., Worcester, Mass., drop forgings, has filed with the secretary of Massachusetts a statement of its financial condition as of June 30, 1920, which shows total assets and liabilities of \$6,649,136, contrasted with \$5,364,106 at the close of the previous year. A feature of the statement was the shrinkage in Liberty bonds and other Government securities owned by the corporation, amounting to \$911,307, bringing that item down to \$681,869.

The directors of the Carbon Steel Co., Pittsburgh, at their regular quarterly dividend meeting, Dec. 28, failed to take any action on the dividend on the common stock of the company. Charles McKnight, president of the company, stated that the failure to declare a dividend at this time was due to the present condition of the steel market and the indefinite outlook for the future.

OFFICE CHANGES

The Stewart Iron Co., Ltd., Cleveland, has changed its name to the Stewart Furnace Co. The office of the company is at 1335 Kirby Building, Cleveland.

The Cincinnati office of the Wagner Electric Mfg. Co., St. Louis, in charge of I. W. Pettingill, has removed to 20 East Ninth Street, at which a service station will also be opened.

The David S. Foster Sons & Co., Utica, N. Y., iron and steel warehouse has changed its name to the Gerard S. Foster Co. The former company succeeded Thomas Foster in 1893 when David S. Foster, a son, purchased it after the death of his father. Gerard S. Foster is a son of David S. Foster and succeeded to the business last June on the death of his father. Associated with him is Burt A. Rogers, one of the members of the former firm.

The Chicago Pneumatic Tool Co. has appointed R. F. Eissler assistant to the vice-president with headquarters in the company's new office building at 6 East Forty-fourth Street, New York. W. C. Straub, formerly New Orleans district manager, has been appointed to the Pittsburgh branch to succeed Mr. Eissler, and Ross Wyeth, formerly attached to the Pittsburgh office, is in charge of the New Orleans branch succeeding Mr. Straub.

The National Acme Co., Cleveland, manufacturer of "Gridley" and "Acme" automatic screw machines, auxiliary screw making machinery, self-opening die heads, collapsible taps, and standard screw machine products, will remove its Chicago sales office from 23 South Jefferson Street to a new building at 559 West Washington Boulevard about Feb. 1. The new structure contains two stories and a basement with 7500 sq. ft. of floor space. The basement and first floor will be used for a stock of standard screws and nuts and machine parts, and chasers for dies and taps. Offices and a machine display room will be located on the second floor. R. J. Preston, Western manager, will be in charge.

The Tropenas Co., engineer, 2243 Nostrand Avenue, Brooklyn, N. Y., has opened an office in Rio de Janeiro with the address of Quarto 321, 9, Avenida Rio Branco, in charge of E. Roubieu.

The Pardee Steel Corporation, Perth Amboy, N. J., has opened new branch offices in the following cities: 40 Central Street, Boston; World Building, New York; Land Title Building, Philadelphia and Slaughter Building, Dallas, Tex.

The American Scrap Iron Co. has changed offices and yards to the following: general offices, 836-837 Second National Building, Akron Ohio; branch office and yards, 37-73 S. Manchester Road, Kenmore, Ohio.

The Detroit branch of the Atlas Crucible Steel Co., tool steels, Dunkirk, N. Y., will move Feb. 1, to 1437-1459 Franklin Street. The company recently purchased this property, which is a one-story brick structure, saw tooth roof, 100 x 120 ft. This will give the company over twice the warehouse space which it now has.

NEW TRADE PUBLICATIONS

Twist Drills and Tools.—National Drill & Tool Co., Detroit. Catalog No. 11, 239 pages, 5 x 7 1/2 in. Lists and illustrates an extensive line of high speed and carbon twist drills, reamers, milling cutters and special tools. One section of the booklet is devoted to millimeter sizes of the drills, reamers and cutters. Useful tables of speeds, decimal equivalents, weights, etc., are included.

Duff Jacks.—Duff Mfg. Co., Pittsburgh. Catalog No. 104, 136 pages, 6 x 9 in. Illustrates and describes the company's lifting jacks for railway, automotive and industrial purposes and ranging in sizes from 1 to 75-tons lifting capacity. They include high speed ball bearing screw and ball bearing journal jacks, Barrett track or trip and lowering jacks, telescope screw and traversing base and shoring jacks, motor car and motor car truck jacks, etc.

Portable Belt Conveyor.—George Haiss Mfg. Co., Inc., 141st Street and Rider Avenue, New York. Booklet 1020. Illustrations with descriptions of portable self conveyors. Illustrations show applications of the conveyor to unloading hopper-bottom cars directly into trucks and to storage piles, unloading trucks to ground storage, reclaiming from storage piles, etc.

Floor Covering.—Philip Carey Co., Lockland, Cincinnati, Ohio. Folder. Explains the advantages, and views show applications of a floor covering which consists of a saturated wool felt paper, coated, and with flake mica embedded in the wearing surface. It is 1/8 in. thick and is furnished in rolls.

Precision Thread Grinders.—Precision & Thread Grinder Mfg. Co., 1932 Arch Street, Philadelphia. Loose leaf catalog of 11 sheets, 8 1/4 x 11 in. Concerned with a multi-graduated precision thread grinder for use as an attachment and as a complete machine. The attachments are for internal and external thread grinding, but can be used for surfaces of peculiar angles, radii, both concave and convex, combinations of straight, tapered and curved surfaces. These attachments were illustrated and described in THE IRON AGE, issue of Jan. 29, page 336.

Ultra Violet Light Outfit.—Cooper Hewitt Electric Co., 95 River Street, Hoboken, N. J. Two bulletins. Bulletin No. 102 deals with Cooper Hewitt quartz lamp and ultra-violet light, and bulletin No. 86 with a quartz lamp laboratory outfit as a source of ultra-violet light for chemists, dermatologists and physicists.

Handbook for Drillers.—Cleveland Twist Drill Co., Cleveland. Booklet with the title "Handbook for Drillers," and designed for students of drilling. It is not intended as a complete treatise on the subject, but rather as an introduction to the theory underlying the use of the twist drill. There are 37 pages, 4 1/4 x 7 1/4 in., illustrated.

Mayari Pig Iron.—Bethlehem Steel Co., Bethlehem, Pa. Deals with Mayari pig-iron, "a nickel-chromium alloy iron for high-grade iron castings." This pig iron is made from a special ore which is found in the province of Oriente (formerly Santiago) on the island of Cuba.

Vises.—Read Mfg. Co., Erie, Pa. Folder with the title "The Primary Function of a Vise." Explains the essential points in the design of a vise and explains the advantages of those of the company's manufacture.

Pyrometers and Belt Fasteners.—Bristol Co., Waterbury, Conn. Five bulletins as follows: Bulletin 212 illustrates and describes the company's patent steel belt lacing, steel belt hooks and steel belt plates and bifurcated steel rivets; No. 711, steel belt lacing; No. 274, indicating electric pyrometers; No. 275, electric pyrometers including new high resistance models of indicating and recording types; No. 300, high resistance electric pyrometers with new patent internal automatic cold-end compensator.

Steel Sashes.—Allison Steel Products Co., Chester, Pa. Catalog, 48 pages, 9 x 12 in. Concerned with Allison steel sash which, it is explained, is essentially a fabricated steel window, the sections being solid rolled steel bars, so constructed that they are proof against internal corrosion or disintegration.

Oil Filters, Exhaust Heads and Ventilators.—Burt Mfg. Co., Akron, Ohio. Catalog, 128 pages, 5 1/4 x 8 1/4 in. Illustrates and describes the Cross American and Warden oil filters, Burt oil filtering system, Burt and Standard exhaust heads, Burt combination skylight and ventilator and Burt rotary ventilator. Numerous installation views are shown.

Equipment for Industrial Lunch Rooms, Rest Rooms and Clubs.—Albert Pick & Co., 208 West Randolph Street, Chicago. Catalog, 290 pages, 8 1/2 x 11 1/2 in. Deals with furnishings, equipment and supplies for industrial lunch rooms, rest rooms and clubs. The various items are illustrated.

Tubular Steel Poles.—National Tube Co., Pittsburgh. Bulletin No. 14C. Illustrates and describes tubular steel poles for trolley lines, telephone lines, lighting poles, transmission lines, flag poles, etc. Condensed tables giving essential details for the maker and user are included.

Throatless Shears.—Marshalltown Mfg. Co., Marshalltown, Iowa. Catalog. Illustrates and describes throatless shears, bevel shears, splitting shears, and plate millers. The throatless shears, it is stated, will take sheets and plates of unlimited width and cut curves of small radius in any direction. They are built in various sizes having capacities from 1/2 in. down to tin.

Perforated Radial Brick Chimneys.—M. W. Kellogg Co., 90 West Street, New York. Gives standard specifications for perforated radial brick chimneys, intended to aid the architect or engineer in designing a radial brick chimney.

Mechanical Sand Handling and Carrying Equipment for Foundries.—C. O. Bartlett & Snow Co., Cleveland. Booklet with the title "Ideas for the man who wants to make his foundry more profitable, more productive and more human." It illustrates and describes foundry installations designed to show the possibilities of mechanical sand handling equipment and mechanical carrying equipment.

Portable Conveying Machinery.—Brown Portable Conveying Machinery Co., Chicago. Catalog, 48 pages, 8 1/2 x 11 in. Illustrations with descriptions of a line of portable and sectional elevating, conveying, loading and unloading machinery for the rapid handling of materials of various kinds.

Tank Regulators.—Fulton Co., Knoxville, Tenn. Leaflet. Illustrates and describes tank regulators for the temperature regulation of liquids heated by steam.

Factory Equipment for Storing and Handling Material.—Standard Steel Equipment Co., Twentieth and Allegheny Avenue, Philadelphia. Pamphlet. Illustrates and describes unit bin box, shelving, lockers, convertible truck and adjustable platform.

Thread Miller.—Smalley General Co., Bay City, Mich. Circular. Illustrations with descriptions of the company's No. 1-B thread miller, No. 1-C thread miller with power traverse, and No. 4 hollow spindle thread miller.

Heat-Treatment Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Bulletin No. 222. Descriptions with illustrations of heat-treatment furnaces of the car type and car-and-ball type.

Drop Forgings.—Union Switch & Signal Co., Swissvale, Pa. Catalog No. 97. Views of typical forgings produced by the company for automobiles, aeroplanes, trucks, tractors and engines, and made of open hearth or alloy steel.

Copper Clad Steel Wire.—Copper Clad Steel Co., Brad-dock, Pa. Pamphlet, 19 pages. Gives tables in convenient form pertaining to the properties of "Copperweld" wire, and for engineers, superintendents, purchasing agents and general users of wire. The company also has issued a folder describing this product, which is illustrated sectionally in the natural coloring of steel and wire.

Brinell Hardness Testing Machine.—Scientific Materials Co., Pittsburgh. Pamphlet. Deals with the latest improved American model of the Brinell hardness testing machine with the straight line motion depth measuring gage. Depth and diameter tables for use with the machine are included. The company has also issued an 8-page pamphlet on metallurgical equipment for the examination and photography of microstructural metals, and a folder dealing with the F. & F. optical pyrometer.

Calendars.—Dearborn Chemical Co., 332 South Michigan Avenue, Chicago. Consists of 12 sheets, 19 x 27 in. The upper half of each page shows views in the company's laboratories and factories. The calendar is printed black on white, with holidays in red.

Chas. A. Schieren Co., 30 Ferry Street, New York. Size 11 x 17 in. with a calendar pad of 12 sheets, 6 1/4 x 3 in. A steer's head is shown in the center of a roll of leather belting. The calendar pad is printed black on white, with holidays in red.

General Electric Co., Schenectady, New York. Consists of 12 pages 16 x 24 1/2 in. Each sheet has a three months' calendar printed black on white with holidays in red. Half-tone reproductions of the company's products are shown at the top of each sheet.

Youngstown Sheet & Tube Co., Youngstown, Ohio. Has six pages, 15 1/4 x 25 in., printed front and back. The calendar is 15 1/2 x 9 1/2 in., printed black on white with holidays in red. Views at the top of each sheet show various processes in the manufacture of iron and steel.

Central Iron & Steel Co., Harrisburg, Pa. An enameloid mounting, 9 x 17 in., with a calendar pad 6 1/4 x 7 in., having a separate sheet for each day of the year printed black on white.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes*

Bars:	Per Lb.
Refined iron, base price	4.25c.
Swedish bars, base price.....	20.00c.
Soft steel bars, base price.....	3.48c. to 3.70c.
Hoops, base price	4.18c. to 4.65c.
Bands, base price	4.18c. to 4.65c.
Beams and channels, angles and tees	
3 in. x ¼ in. and larger, base.....	3.58c. to 3.80c.
Channels, angles and tees under 3 in. x	
¼ in., base	3.48c. to 3.70c.

*The low prices are those of the Carnegie Steel Co. and are subject to a cartage charge of 15c. per 100 lb. in the Metropolitan district and 10c. per 100 lb. to local points in New Jersey.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.75c.
(Smooth finish, 1 to 2½ x ¼ in. and larger) ..	4.25c.
Toe calk, ½ x ¾ in. and larger.....	5.00c.
Cold-rolled strip, soft and quarter hard.....	10.00c. to 10.50c.
Open-hearth spring steel	6.50c. to 8.00c.
Shafting and Screw Stock:	
Rounds	5.50c.
Squares, flats and hex.....	6.00c.
Standard cast steel, base price.....	15.00c.
Best cast steel	20.00c.
Extra best cast steel	25.00c.

Tank Plates—Steel

¼ in. and heavier.....	3.78c. to 4.00c.
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Sheets

Blue Annealed	Per Lb.
No. 10	4.68c. to 4.90c.
No. 12	4.73c. to 4.95c.
No. 14	5.00c.
No. 16	5.10c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Wood's Refined, Per Lb.
Nos. 18 to 20	5.80c.
Nos. 22 and 24.....	5.85c.	6.80c.
No. 26	5.90c.	6.90c.
No. 28	6.00c.	7.00c.
No. 30	6.25c.

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	6.35c.
No. 16	6.60c.
Nos. 18 and 20	6.75c.
Nos. 22 and 24	6.90c.
No. 26	7.05c.
No. 27	7.20c.
No. 28	7.35c.
No. 30	7.85c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk. Galv.	Wrought Iron	Blk. Galv.
½ in. Butt... —40	—23	¾-1½ in. Butt. —	3 +17
¾-3 in. Butt. —44	—28	2 in. Lap.....	+ 3 +21
3½-6 in. Lap. —39	—24	2½-6 in. Lap..	+ 1 +17
7-12 in. Lap.. —32	—15	7-12 in. Lap....	+12 +30

Steel Wire

	Per Lb.
BASSED PRICE* ON NO. 9 GAGE AND COARSER	
Bright basic	5.75c.
Annealed soft	5.75c.
Galvanized annealed	6.50c.
Coppered basic	6.25c.
Tinned soft Bessemer	7.25c.

*Regular extras for lighter gages.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Brass Sheet, Rod, Tube and Wire

	BASE PRICE
High brass sheet	22½c. to 23c.
High brass wire	23¼c. to 24c.
Brass rod	20¼c. to 23c.
Brass tube	38¼c. to 40c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 23½c. to 24½c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade	Grade	Coke—14x20	Primes	Wasters
	"AAA"	"A"			
	Charcoal	Charcoal			
	14x20	14x20			
IC..	\$12.15	\$11.15	80 lb....	\$8.30	\$8.05
IX..	13.95	12.95	90 lb....	8.40	8.15
IXX..	15.75	14.55	100 lb....	8.50	8.25
IXXX..	17.35	16.15	IC....	8.75	8.50
IXXXX..	18.95	17.75	IX....	9.75	9.50
			IXX....	10.75	10.50
			IXXX....	11.75	11.50
			IXXXX....	12.75	12.50

Terne Plates

	8-lb. Coating 14 x 20
100 lb.	\$8.85
IC	9.00
IX	10.00
Fire door stock.....	12.00

Tin

Straits pig	40c.
Bar	45c. to 50c.

Copper

Lake ingot	16½c.
Electrolytic	16½c.
Casting	16½c.

Spelter and Sheet Zinc

Western spelter	7½c. to 8c.
Sheet zinc, No. 9 base, casks	13½c. open 14c.

Lead and Solder*

American pig lead	6c. to 7c.
Bar lead	7c. to 8c.
Solder, ½ and ½ guaranteed	27c.
No. 1 solder	24½c.
Refined solder	20½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	80c.
Commercial grade, per lb.....	40c.

Antimony

Asiatic	7½c. to 8½c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb....	35c to 38c.
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Old Metals

Business is still very quiet, but there seems to be an undercurrent of better feeling. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.25
Copper, heavy and wire	9.75
Copper, light and bottoms.....	8.25
Brass, heavy	6.50
Brass, light	4.75
Heavy machine composition	9.50
No. 1 yellow brass turnings	6.00
No. 1 red brass or composition turnings.....	8.00
Lead, heavy	3.50
Lead, tea	2.50
Zinc	3.00

